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In another column will be found some correspondence in relation to the transmutation of silver into gold and Dr. Emmens' alleged discovery of "argentaurum." Further consideration has been delayed by the pressure of other work and the absence of the editor who has the matter under special charge, but we hope soon to present full comment upon the case as it stands.

The formation of the proposed pool of manufacturers of wrought-iron and steel pipe has been given up for the present and the meeting which was to have been held has been postponed indefinitely. It is said that some of the large mills declined to take part; at any rate, the supporters of the plan have apparently realized that the present is not a favorable time for a new combination, and that it would be impossible to unite the trade now in any such movement. It is to be hoped that the plan is disposed of for good.

Affairs at Leadville continue in a very unsatisfactory condition. Two or three of the mines have gone to work with the men brought from Missouri and elsewhere, under the protection of the militia; but the larger number are still idle, though some are making arrangements to resume. The accounts received further make it evident that a new outbreak of violence would follow the withdrawal of the armed force, and it is not possible that the present state of affairs can continue much longer. Some of the despatches, which are somewhat conflicting, report attempts at compromise, but they do not seem yet to have received support enough from either side to promise success.

The special telegraphic report which we published last week, and the more detailed account of the meeting given by our special correspondence in another part of the present issue, show that the American Institute of Mining Engineers has seldom met with a heartier welcome or been more royally entertained than during the Colorado meeting, which closed on Monday of this week. In that respect the meeting was a very successful one; but the very heartiness of the reception, however pleasant it was to the visitors, interfered to some extent with the business. We think that a study of the report will tend to support and emphasize the views with regard to these meetings which were expressed in our issue of September 19th last.

In the London papers of September 16th there appeared a despatch from Johannesburg to the effect that the High Court of the Transvaal had given a decision affirming the validity of the MacArthur-Forrest cyanide patents in that country, and holding the defendant companies in the suit liable in the full amount of royalties claimed under those patents. On the following day, however, a communication from the African Gold Recovery Company appeared in the same papers, saying that the company had received no advice of any such decision. As no further information has been received, it appears probable that the original despatch was without foundation, or at least incorrect; but why it was sent, or by whom, seems not to be known.

We have several times referred to the very remarkable increase in the consumption of copper in Europe this year, as shown by the continued large exports from this country which have been absorbed without difficulty. Messrs. James Lewis & Sons, excellent authorities in the copper trade, estimate from the statistics that for the three-quarters of the present year which have already passed the quantity of fine copper which has been consumed in Great Britain, Germany and France has been greater by 27,800 long tons than in 1895—a remarkable showing, the gain this year being 33.6 per cent. over last. The increased consumption is due to greater activity in manufacturing, especially in the lines of electrical work and war material, both requiring large quantities of copper.

The action of the Pittsburg coal miners, in voting to accept a reduction in wages for mining from 70 cents to 54 cents per ton, has, as we anticipated, affected wages all through the mining districts of the West. In Ohio and Indiana discussions over proposed reductions are going on in almost every district, with the prospect that lower wages will have to be accepted in the end. In Illinois less is heard, chiefly because the trade has already been in a very bad condition for several months, and it has been a question of work rather than of wage rates. The Western coal trade, in fact, is in a demoralized state; the Lake trade, which is nearly over for the season, has not been good, and the demand in Cleveland, Chicago and the manufacturing cities generally has been disappointingly small. Unless December brings a revival the competition for the rail trade this winter will be keener than ever and prices lower.

The report of the Committee of Mine Inspectors on the Twin Shaft disaster near Pittston, Pa., in June last, in which 58 persons lost their lives, has been submitted to the Governor of Pennsylvania, and an abstract is given elsewhere. The inspectors seem inclined to think that, while the workings had begun to cave before the final crash occurred, the catastrophe

was preceded and perhaps hastened by an explosion of gas. While this may have added to the loss of life and prevented the escape of some of the men, it would seem to have been the result of the squeeze which had already begun, rather than the occasion of its further extension.

The weak point in the report, as shown by a first reading, seems to be a certain hesitancy about placing the blame, and a disposition to put the entire responsibility upon the superintendent, who lost his life with his men, and is, therefore, unable to defend his course. It seems very probable that he acted rashly in putting himself and his men into the position which they occupied when the final catastrophe occurred; but on other points there may well be a difference of opinion.

The report has been received too late to permit full comment at the present time, but we hope to refer to it more fully hereafter.

Our regular news columns have for some time past borne witness to the mining activity at present prevailing in British Columbia. The older mines in the established districts are generally doing well; there is a rush of prospectors everywhere; new claims are constantly being located and mines opened. Moreover, the country is attracting much attention abroad and new capital is going to it in considerable amounts from this country, from the older provinces of Canada and from Great Britain. For all this there seems to be a solid basis; undoubtedly the mineral wealth of the country is great, though probably its resources are quite equaled by those on this side of the international boundary line in Idaho, Washington and Montana, and again to the south of us in Mexico.

While we are pleased to see the prosperity of our neighbors, we find that, as in all similar cases, there is a warning to be given. Apart from the tendency to over-capitalize companies and to ask exorbitant prices for properties really having merit, there is no doubt that in many cases prospects of very doubtful value are being offered as mines. The always active promoter is taking advantage of the attention which British Columbia is attracting, and will do great damage to the real interests of the country if he is allowed to go on, and will cause the loss of many investments. No prospectus statements should be accepted by the investor, and no property should be bought except on careful investigation by reliable experts. This is common sense everywhere, but it is especially to be applied to a "booming" district. It is much wiser to keep out of such districts than to invest at unsafe prices or to buy wild-cats, not a few of which make their homes in British Columbia.

Pig-Iron Production.

Pig-iron production in the United States, which started in this year at a very high level, the furnaces in blast in January producing at the rate of about 11,000,000 tons a year, has been falling steadily, and during September the capacity of the active furnaces was but little over 132,000 tons weekly, or at the rate of about 6,750,000 tons a year. Anthracite and coke furnaces alike have felt the depression; though it has, perhaps, fallen a little more severely upon the Eastern makers of anthracite pig. The charcoal furnaces, however, have not only kept up their output, but increased it, showing that the demand for this class of iron is not altogether a thing of the past. Charcoal pig, however, forms so small a part of the output—only about 4.8 per cent. of the present production—that the activity of these furnaces affects the totals but slightly.

The Southern furnaces, on the whole, have kept up production better than those of any other section, and many of them have been running steadily when the Eastern stacks were, one after another, going out of blast, and even the makers of Bessemer pig in the Central West were giving up. This has been without doubt due to the low costs of their ore and fuel supplies, which have enabled them to accept prices which the Western makers could not take under the high quotations of Lake Superior ore which have ruled throughout the year, and also the continued high prices of coke. At one time, indeed, the activity of the Alabama furnaces threatened a general demoralization in pig-iron prices; but recent heavy sales on speculative account—and to a much smaller extent sales for export—have removed the surplus and steadied the market.

There are some indications that about the lowest point in production has been reached. Demand is improving a little; stocks are increasing, and we hear of more furnaces going into blast than are going out. The October output will probably be no less than that of September, if it is no greater. While no one is willing to say that there will be any marked improvement before December, some furnaces are getting ready for a rush. At the least indication of improvement there would be a large increase in production.

The total production for the nine months to the end of September this year has been, in round figures, 7,100,000 tons. On account of the heavy output for the first quarter of the year this total is nearly 550,000 tons greater than that reported for the corresponding period in 1895; though the approximate weekly production in September was less by 71,000 tons than that of a year ago.

The course of pig-iron production this year has been almost exactly the reverse of last year's conditions. In 1895 the year began with a small

production, which increased but slowly for several months, took a sudden start in June and advanced very rapidly until it reached its highest point about the end of September. A reaction followed, and the output declined slowly until the end of the year. The present year began with great activity in the furnaces; but the number in blast has declined, and in September reached what we hope and believe is the lowest to be noted for the year. Whether the parallel—or rather the contrary—is to be carried out, and an upward reaction follow, remains still to be seen.

However this may be, it is apparent that there will be no considerable improvement in prices of pig iron this year. The great idle furnace capacity ready to start up on any indication of improving demand is quite enough to check any movement of this kind before it gains much headway.

Competitive Designs for Mine and Reduction Plant.

When it is determined to install a hoisting and pumping plant, a mine tramway or cableway, a mill, a smelter, or additions to these or any similar plant connected with the mining business, the first thing for the owners is to find out exactly what they want, and the next to decide who is to supply it. Whether the thing in mind is an elaborate half-million-dollar establishment or a donkey hoist the same questions come up, and often the man who is looking for the right kind of outfit to sink 300 ft. with is as anxious about it as the projector of something ten times bigger.

The subject is a very wide one, and all that can be said here is to touch upon a few of the more prominent points, in the hope that the mention of them may lead to their serious consideration in more detail both by miners and machine-shop men. It is certainly an important matter.

As to competitive designs, this branch of the subject may be disposed of briefly. The cases must be very few where the competitive plan would be at all practicable; far less, indeed, than in bridge building or anything strictly of the civil engineering order, and of course immensely less than in architecture. In this latter art, by the way, the practice of leaving the selection of design to the result of prize competitions is being much discredited at present.

When a mining man wishes to get a plant to accomplish a certain result he generally has a pretty fair idea of what he wants. He may even go directly to the foundry and machine-shop men and get their rates on certain pieces of standard machinery already well known to him, and then figure on freights and cost of setting up and housing. Or he may look a little farther and compare machines or sets of machines of the same general class, but of different make, taking into consideration difference in price. This is ordinarily sufficient, and covers most of the simpler cases. If the mining man, or the company, already has a superintendent who is something of a mechanical and civil engineer, as many are, the matter will be put into his hands for decision, subject only to the money control. Indeed, the move for new plant usually originates with the superintendent. But when the problem is more difficult, either from complexity, newness or size, the usual action is to call in a consulting mechanical engineer who makes mining machinery his specialty. Such a man is picked out because of his reputation, or because of some successful job he has just handled which is of the same kind and is known to the mine people, or more often because of personal acquaintance added to professional reputation. When the problem is of sufficient importance to have a consulting engineer at all, the mining man or company would hardly like to trust to the design and advice of some clever prize winner in a competition, in which, perhaps, nice drawings would have undue weight, just as they do in architectural competitions.

It is imaginable, however, that a case might arise in which the conditions were so intricate and advantages and disadvantages of different plants and processes so evenly balanced, with the money interest involved so great, that there would be room for more than one set of brains to work on it. We have in mind the case of a great mine where the question of the best plant and method for treating a peculiarly difficult ore was laid not only before many successive metallurgists and engineers, but also before several of these men consulting together. It is just possible that in another such case a high reward for the best idea might stimulate the ingenuity of the experts. There may also be some problems in the civil engineering line, in connection with mining, that might possibly be settled in this way; but, as we before observed, they must be very few indeed.

Now a great deal of trouble is taken off the minds of the mining men by the custom which all the great machine shops in the mine supply trade have adopted of employing expert engineers who understand mining requirements, men to superintend shipment and delivery of machinery, others to set boilers, build stacks and reverberatories, put up buildings, set up the machinery, and, in fact, take charge of the whole installation. For the future standing of the supplying establishment this work is usually well or fairly well done, and often a good deal better than the local talent could do it. The advice of the makers' engineers as to selection of plant may not be exactly disinterested, but it is at least intelligent and comparable with other advice. But the big machine

shops, in their own interest, are very careful of their reputations. Shops which do not do a general mine supply business, but only manufacture one or a few specialties, do not make a practice of setting up their machines, but will always give instructions and can supply needed accessories.

NEW PUBLICATIONS.

MÉTHODES D'ANALYSE DES FONTES, DES FERS ET DES ACIERS. Par M. Ad. Carnot, Inspecteur General des Mines, Membre de l'Institute. Paris; Vve., Ch. Dunod & P. Vicq, Editeurs Libraires des Corps Nationaux des Ponts et Chaussées, des Mines et des Télégraphes.

In this "Extrait des *Annales des Mines*, Octobre-Novembre, 1895," M. Ad. Carnot has given us an excellent description of various methods used in France and elsewhere for the analysis of pig iron, wrought iron and steel. It corresponds to Blair's *Chemical Analysis of Iron*, in so far as this treats of such matters, but is more restricted in its nature than Blair's standard work. It differs also from Blair in going more into the description of the various kinds of carbon, for instance, and in a certain critical discrimination between the chief methods proposed for the chemical examination of iron and steel. Perhaps the general chemist who has to examine not only iron and steel, but ores, coal, coke, limestone, etc., as well, will find Blair more useful, especially the last edition, but Carnot's book will certainly rank well along with Blair, and will be particularly useful to those whose work is closely confined to the products of blast furnaces and steel plants. M. Carnot has himself contributed much to the advancement of this branch of analytical chemistry, especially in his phosphorus method, first published in the *Annales des Mines*, Vol. II., 1893, p. 5 in his researches both on gravimetric and volumetric determinations of manganese and chromium, and in his excellent comments on various methods, published from time to time in the *Annales des Mines*.

He speaks, therefore, as one who understands the practical difficulties in iron analysis: who has himself experienced them, and who can suggest ways and means to the busy every-day chemist. This, after all, is the Ultima Thule of successful book-writing, to describe briefly and clearly what the busy man wants to know; to tell him not only what to do, but how to do it. Nowadays, chemists in charge of iron and steel laboratories, pressed for results every hour of the day, have not the time to investigate methods for themselves. The utmost they can do is to modify methods to suit their own emergencies. It is, of course, interesting to them to know that carbon may exist as or in ferrite, cementite, sorbite, martensite and troostite. It may even be highly important that they should know this, but it is absolutely necessary that they should know, and know thoroughly, the most accurate and the most speedy method of determining the amounts of the different kinds of carbon that influence the quality of the metal with which they have to do. Until we reach such a state of perfection as shall enable the chemist to work hand-in-hand with the microscopist, the chemist is supposed to have the last word and he is fortunate in having so many things to fall back on! Take M. Carnot's book for instance. We have carbon, silicon, phosphorus, sulphur, manganese, chromium, nickel, (and perhaps cobalt), tungsten, molybdenum, titanium, vanadium, aluminum, magnesium, calcium, arsenic and copper. These certainly seem to be enough to hide behind, but if not, why we can call in oxygen, nitrogen and ammonia, and there you are!

The space at disposal does not allow a protracted review of M. Carnot's excellent book, for in its details it covers some 180 pages, but a fair idea of its general nature can be reached, perhaps, through his remarks on carbon. He adopts Osmond's classification of carbon, to wit:

1. Ferrite, almost entirely free of iron.
2. Cementite, corresponding, probably, to Fe_3C , occurring in cement steel, the lamellæ of relatively large sizes, and easy of isolation. It would, perhaps, be best to call this Rinman's carbon, as he was the first to investigate it.
3. Sorbite, tempering carbon, is ordinarily intermixed with cementite and forms with it the substance known as perlite.
4. Martensite, principal constituent of tempered steel, formed of *crystallites* of iron holding tempering carbon (sorbite) in solution.
5. Troostite, which accompanies and generally borders martensite in tempered steel.

But for practical purposes he divides carbon into four groups—graphite; graphitic tempering carbon (the *graphite invisible* of Forguignon, and the *graphitische Temper Kohle* of Ledebur); carbon of carburation, or carbon of cementite (the *carbone de recuit*, of Osmond, and the *gewöhnliche Carbid Kohle*, of Ledebur); and, lastly, tempering carbon, or hardening carbon (*Härtungs Kohle*).

These four or five kinds of carbon may be differentiated with more or less certainty by chemical and microscopical means, so as to enable one to say that they do exist in iron or steel. But when it comes to the actual quantitative estimation of them it cannot be said that the matter is so clear.

The methods of chemical analysis given by M. Carnot deal, therefore, with the ordinary determinations of total carbon, graphite and combined carbon, meaning by this latter term the difference between the total carbon and the graphite. He describes fully the chief dry methods, oxidation by a current of oxygen at red heat, employment of a current of dry chlorine, and oxidation by bisulphate of potash at red heat. Under the wet methods he discusses the bichloride of mercury, the double chloride of copper and potassium, sulphuric and chromic acids, and the determination of the volume of carbonic acid evolved.

His methods are generally up to date, with the possible exception of the use of chromate of lead in conjunction with oxide of copper, and the use of the Blair perforated platinum boat instead of the old glass cylinder and coil of platinum. No one who has ever used the perforated boat, with its asbestos-covered bottom, would ever willingly return to the glass cylinder, which is an *echtes Schmerzenskind*. Under phosphorus, there is no mention of Emmerton's method, nor that of Handy, the so-called Pittsburg method, which is certainly to be regretted. Either of these methods is to be preferred to those given. But the American methods for estimation of phosphorus are the result of the unremitting demand for rapidity, and

perhaps the conditions in France are not so exacting. The extremely rapid and accurate method of estimating manganese by treating borings with nitric acid, then with peroxide of lead, precipitating in a centrifugal machine, decanting and then titrating with a standard solution of arsenious acid, is not mentioned, although it is the most expeditious method now in use. Aside, however, from these minor matters, M. Carnot's book is a notable contribution to analytical chemistry and is sure of a hearty welcome.

W. B. P.

BOOKS RECEIVED.

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

Chemistry for Beginners. By Edward Hart. Easton, Pa.; Chemical Publishing Company. Pages, 245; illustrated. Price, \$1.50.

United States Geological Survey: The Stone Industry in 1895. By William C. Day. Washington, D. C.; Government Printing Office. Pages, 61.

Natal: Departmental Report of the Commissioner of Mines, July 1st, 1894, to December 31st, 1895. Pietermaritzburg, Natal; Government Printer. Pages, 27.

The Development of the Periodic Law. By F. P. Venable. Easton, Pa.; Chemical Publishing Company. Pages, 321; with diagrams and illustrations. Price, \$2.50.

Locomotive Mechanism and Engineering. With an Appendix on the Modern Electric Locomotive. By H. C. Reagan, Jr. New York; John Wiley & Sons. London; Chapman & Hall, Limited. Pages, 419; illustrated. Price, \$2.

Experiments upon the Contraction of the Liquid Vein Issuing from an Orifice and upon the Distribution of the Velocities within it. By H. Bazin. Translated from the French by John C. Trautwine, Jr. New York; John Wiley & Sons. London; Chapman & Hall, Limited. Pages, 64; with diagram. Price, \$2.

CORRESPONDENCE.

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

The Transmutation of Silver Into Gold.

Sir: In your issue of September 5th, in editorially referring to the description on another page of the recent discovery of Dr. Emmens, you say, "So far as our knowledge goes there is nothing yet known that gives any firm ground for a belief in the transmutation of the elements; in fact the tendency of scientific investigation seems to lead to the opposite conclusion." Now we are quoted in the description mentioned as saying: "The periodic law and other considerations have long led chemists to anticipate some such results as are now claimed." As your assertion is directly antagonistic to this remark somebody must be lacking in information. Without posing as the champions of Dr. Emmens, who seems abundantly able to take care of himself, we will refer you to the article on Elements by Frank Wigglesworth Clarke in the last (1892) edition of Watts' Dictionary of Chemistry. A few quotations from this article should be sufficient to substantiate what we have said ourselves. Prof. Clarke writes: "In the beginnings of chemistry the fact that one substance could be transformed into other substances gave rise to all manner of alchemical speculation. Transmutations of matter gave the young science its only *raison d'être*, and no good reason existed for assigning any limit to such transmutability. The labors of the alchemists, therefore, were not at all unphilosophical, but, on the contrary, they represented efforts at generalization, which were perfectly legitimate in their day. But as the modern conception of an element developed, limitations not previously recognized became evident, and the pendulum of chemical opinion swung over toward a belief in the absolute independence and individual integrity of the elementary bodies. From this point of view all theorizing as to the nature of the elements became unprofitable, and, indeed, was put outside the proper range of scientific investigation. Of late years, however, the question has been reopened, the ultimate character of the elements is no longer positively assumed, and the belief is gaining ground that they have been derived from still simpler forms, possibly one form, of matter by some process of evolution. It will be observed that the only evidence in favor of their elementary nature lies in our present inability to decompose them, and that evidence is purely negative. It signifies merely a limitation in our immediate resources, not a limitation essential to the things themselves. On the other hand, the elements are connected by so many intimate relations that their complete independence of each other is hardly supposable." Further on in the article he says: "There is spectroscopic evidence in favor of elementary evolution. This evidence gives rise to the theory that the evolution of planets from nebulae had been accompanied by an evolution of the chemical elements." Referring to Lockyer's conception that in the hotter stars the elements are dissociated, Professor Clarke adds: "It may be further emphasized by the fact that the 18 commoner elements are all of relatively low atomic weight, while the higher, denser, and probably more complex metals, are, as a rule, scarce." After referring to Prout's hypothesis of one primal form of matter and Crookes' experiments on fractional precipitation, Professor Clarke closes as follows: "This work of Crookes, as represented in his address of 1886 before the British Association, and in two later lectures before the Chemical Society, brings us face to face with the final question of all. Admitting that the elements have been somehow evolved from simpler primal forms, can the process ever be repeated or reversed artificially? To this question no answer is now possible; but it seems likely that if a transmutation of so-called elementary matter should ever be effected in the laboratory, it will be by the very slow development, under conditions of prolonged chemical stress, of change in traces only."

It is evident from these statements that so high an authority as Professor Clarke is quite willing to admit the possibility of the transmutation of elements, and he shows that the most recent scientific investigation tends decidedly in that direction.

VON SCHULZ & LOW.

DENVER, Colo., Sept. 10, 1896.

Dr. Emmens' Transmutation of Silver into Gold.

Sir: The discussion incident upon the alleged invention of transmuting silver into gold by Dr. Emmens, which was appropriately started in the *Journal* of September 5th by your pertinent and timely letter to him, is attracting, as might be anticipated, more than ordinary interest among those whose familiarity with these metals has largely been gained during the arduous task of obtaining a livelihood by wrestling them from beneath the wrinkled countenance of mother earth. If, indeed, the laboratory is to monopolize the production of the more valuable of these metals, then, surely, the miner should not be the last to know of it. Even a cursory analysis of the claims made by Dr. Emmens, as given in the issues of the *Engineering and Mining Journal* of September 5th and 12th, which include the "series of notes" emanating from him and published in the *New York Journal* of August 16th, and which latter he has declared to be "substantially correct," cannot fail to leave the reader in doubt and perplexity.

Dr. Emmens claims that he submits silver to a treatment (of which more below) whereby he obtains eventually a substance which "can be aggregated into molecules" which show a yellow color, green by transmitted light, insoluble in either hydrochloric or nitric acids, soluble in *aqua regia*—in short, he produces a material which "is endowed with the properties of ordinary metallic gold" which, under the microscope, is "indistinguishable from ordinary gold," and he feels assured that when produced in bulk "it will comply with all the tests of the United States mint, and will be accepted by the commercial and financial world as being in very fact true gold," and which "could be proved to be gold in a court of law." Of this material he claims to have manufactured 4 oz. from 6 oz. of silver.

According to his statement, Dr. Emmens was led to experimenting by results obtained by others, which latter culminated in producing silver in "a condition of extremely minute subdivision." His own labors enabled him to bring about a "further subdivision of the silver" whereby the basis was laid for the alleged transmutation of this metal into gold. In bringing about this result no means were employed except those involving physical energy or force. His success was achieved by "certain physical methods and by the aid of certain apparatus," although "construction and safe manipulation of new apparatus, in which vast energy will be employed," seems to be a desideratum, in order to eliminate "the element of personal danger." At any rate, the process of manufacturing gold does "not consume any chemicals."

It is clear, therefore, that Dr. Emmens claims to dissociate the molecular constitution of silver solely by physical power; that he resolves it into its ultimate state of atomic division, then, by means of the same energy re-assembles the substance thus obtained, and—without the interference of any chemical agents—finds that he has manufactured gold, or, at least, a metal which is identical with gold in its physical and chemical properties. Upon obtaining this high degree of subdivision the doctor discovers that he has produced a substance which is no longer silver but which he finds himself constrained to regard as the "raw material out of which both gold and silver were constructed by the hand of nature." To this raw material he has given the name of *Argentaurum*, and the symbol Ar (which, however, had previously been appropriated for Argon). Having obtained this raw material, he claims that it can be "aggregated into molecules" having a density "superior" to that of silver, and he thinks it may equal that of gold. He carefully abstains, however, from furnishing specific data upon these points, although their determination should present no difficulties after having obtained four ounces of gold by his transmutation. A flat statement of the exact density of this latter would be more valuable than all the other "tests" put together. During the process of conversion about 25% of the silver is lost.

Whatever this *argentaurum* may be, it can be no startling announcement that its density can be materially increased under appropriate mechanical manipulation and environment, when its source is considered. That gold, silver, platinum, etc., can be so affected is well known. On the other hand, the loss of 25% of the actual silver under treatment is more mysterious. Is this loss mechanical? Is it due to inherent qualities of the metal? Or is it a sort of seigniorage, offered as tribute to its more precious cousin? If chemical agents were used it might well be that some compound were formed which refused to take kindly to transmutation, but as their use is explicitly denied and as no mechanical loss is indicated, this apparent annihilation of matter is a puzzling feature.

Argentaurum, derived from silver, by purely physical means, is not, according to Dr. Emmens, silver (a metal which has hitherto been regarded as indivisible by chemical agents, among which electricity must be counted in part), nor is it gold until, by molecular aggregation, it has been converted into the latter metal. Why this process should not result in the production of some other metallic substance, to which silver may be more closely allied in its physical and chemical properties than it is to gold, is by no means clear. How, indeed, the nascent condition of any given metal which is being derived from the ultimate unit of molecular division of another, can be controlled by physical means as to its eventual development, is likewise a question to which an offhand assertive answer will hardly be accepted.

And yet, Dr. Emmens claims to make a general explanation "which will be satisfactory to the scientific world." However, he makes apparent, delicate distinctions between "scientists of the first class," "second rate scientists," "second-raters" and "scientific minds." To one or the other of these classes his statements may appeal, but it would be truly refreshing to know among which category he classes those who may have the temerity not to find his elucidations entirely acceptable.

The commercial aspect of the case seems to the inventor to be fraught with untold hardships and dangers. In spite of the fact that out of every ton (2,000 lbs.) of silver transmuted, the respectable amount of 500 lbs. is expected to vanish, yet Dr. Emmens anticipates a profit of \$3 on every ounce of silver he converts into gold. Assuming the minted silver of the world to amount to about 2,600,000,000 oz. (about \$4,015,000,000), even \$3 per ounce would net a reasonably large profit. Unhappily this benefit to

mankind will hardly be realized, as he foresees "widespread confusion and ruin," the destruction of "the foundation of all commerce," "a calamity of terrible extent and character" if he should prove, even only to the "scientific minds of the day," that the actual transmutation of silver into gold were a commercial possibility.

Perhaps the meagerness of the doctor's "general explanation" may be referable to fragmentary information on the subject on his own part, because he takes pains to state that "realizing also the vast pecuniary interests at stake, it seemed desirable that no single one of us (he mentions a total of four collaborators) should be placed in a position of complete knowledge." It may be that he prudently remembered the power of gold, in so far as:

"Trade it may help, society extend,
But lures the pirate and corrupts the friend."

Perhaps when he is in position to utilize his invention, the "force engine," wherewith he can produce "a pressure of over 500 tons per square inch," he may vouchsafe some additional explanations. However, as he most naively states, that while he has invented this engine, yet he remains "fully conscious of the fact that there is no material at present known to man capable of forming an apparatus able to resist such a strain"; therefore, after all, if the transmutation-factory should be compelled to await the successful operation of this machine, we may have reason to hope that the commercial relations of the world will be allowed to remain undisturbed for a while longer.

It would be folly, indeed, for any one to venture a prediction as to what results scientific research will not achieve during the next decade, especially, perhaps, in the line of determining ultimate, elemental substances, but it is hardly fair, even to "second-raters" that an alleged discovery of stupendous moment should be announced with a semblance of frankness and that then, as soon as questioned in a perfectly legitimate manner, the supposed discoverer or inventor should hide behind an array of words intended to convey his fear of turning the civilized world topsy-turvey.

From the publications first above referred to the following conclusions must be drawn:

1. Under the agreement with his associates Dr. Emmens cannot be in a position to give full information as to the processes involved in changing silver into gold.
2. Physical energy is used exclusively to accomplish radical molecular disintegration and pronounced changes of chemical characteristics in metals.
3. No actual proof has been offered that gold has been produced from silver, and Dr. Emmens' statement to that effect stands unsupported by his collaborators.

I am satisfied that I cannot more felicitously express my present convictions as to the alleged transmutation of silver into gold, than by quoting from a letter written by Dr. Emmens himself to Messrs. Von Schulz and Low, of Denver, as quoted in the *Engineering and Mining Journal* of September 5th. "Indeed it is hardly to be expected that my associates and I will ever claim to be successful on a practical scale in the large technical establishment we are now organizing."

LOS ANGELES, Cal., Sept. 18, 1896.

F. M. ENDLICH.

Bids for Torpedo-boats.—Proposals were opened at the Navy Department in Washington, September 18th, for the torpedo-boats authorized by Congress at its last session. A large number of bids were received, nearly all the yards on the Atlantic Coast putting in proposals for one or more of the smaller boats. For the smallest size, with 20-knot speed the prices named varied from \$37,000 to \$69,000; for the second size, 22½-knot speed, the bids varied from \$75,100 to \$83,500. For the three larger boats, to be guaranteed a speed of 30 knots an hour, the offers ranged from \$189,000 to \$260,000 each, only four yards offering to take these, the Herreshoff Company, the Bath Iron Works, Dialogue & Son, of Camden, N. J., and the Union Iron Works, of San Francisco. The Bath Iron Works will build two and the Union Iron Works one of the 30-knot boats. The 22½-knot boats will go to Herreshoff and the Columbian Iron Works, of Baltimore.

Railroads in Korea.—The first railroad in Korea, which is to connect the port of Chemulpo with the capital town of Seoul, 25 miles distant, is to be built by an American, Mr. James R. Morse. Mr. Morse was one of the first foreigners to enter Korea when it was opened to foreign trade in 1882, and holds other concessions for mining, electric lighting, etc. The route of the railway has been surveyed by Mr. J. H. Dye, also an American, and the estimated cost is \$1,500,000 in gold. Seoul is only 100 ft. above sea level and the chief engineering work upon the line is a bridge, 1,600 ft. long, across the Han River. Under the terms of the concession the work must be commenced before March 29th, 1897, and it must be finished within two years thereafter. The concession is for 15 years after opening, and it can then be purchased by the Korean government, or the concession extended for further periods of 10 years. A French company has obtained a similar concession for a railroad from Seoul north to Wi Ju, on the Chinese frontier.

American Enterprises in Russia.—A new company, says the *Philadelphia Record*, has been organized in Russia by Mr. Edmund D. Smith, vice-president of the Russian-American Manufacturing Company. This company is to be conducted largely with American capital and entirely under American management. It is called the Nicopal-Mariopal Mining and Metallurgical Company, with a paid-up capital of \$2,275,000, gold, and proposes to secure control of valuable manganese mines in Nicopal, in South Russia. These mines are now under American management, and the ore is to be taken to Mariopal, on the Sea of Azov, where a large steel plant will be erected under the charge of H. S. Loud, formerly of the Illinois Steel Company. The company has already secured the contract for supplying 144 miles of oil-pipe, amounting to about 10,000 tons, in the Caucasus; and to make the delivery in time the company has purchased the entire pipe-plant of Morris, Tasker & Company, with the exception of engines and boilers. The plant is now being shipped to Russia and the pipe is all to be delivered next year. The Russian-American Locomotive Works, at Nijni-Novgorod, are to be opened as a department of the Sor-movo Iron and Steel Works, at that place.

THE REPORT ON THE TWIN SHAFT DISASTER.

Messrs. William Stein, Edward Roderick and Edward Brennen, the three State mine inspectors appointed to investigate the Twin Shaft disaster at Pittston, Pa., on June 28th last, whereby 58 lives were lost, have made their report to Governor Hastings, of Pennsylvania, from which we take some extracts.

The percentage of coal that should be left as pillar supports is a matter about which opinions differ; for it is subordinate to conditions which may exist on the surface, or from the surface down to the top of the coal seam and immediately under it. One mine superintendent may determine to leave 60% of unmined coal as pillar supports, while another would consider 40% sufficient for all purposes. In either case, however, the mine superintendent has the absolute right to decide and to dictate what the dimensions of the mine openings and pillars shall be. There is no State law that gives to the mine inspector a discretionary power in this matter, except in cases where he sees indications of danger to the lives of the workmen. It then would be his duty to advise with the colliery officials as to the proper means to be taken to remove the danger, and, if forced to do so, appeal to the court for an injunction to restrain the operator from further mining until the colliery, or section thereof, has been made permanently safe.

In this case the mine map shows that 66% of coal has been mined under one portion of the lands, 60% from under the bed of the Susquehanna River, and 64% from under other lands, the remaining 35 to 40% being left as pillar supports. The Twin Shaft colliery had always been very gaseous and required very large intake and outlet airways in order to pass the necessary quantity of air for all purposes, yet the inspectors think some of the gangways in this mine were driven too wide and the chambers were opened too wide from them.

They further say that it was known that all the workmen at the foot of No. 3 slope were using naked lamps, and that the gas was "shoving out" to that point. The squeeze had assumed certain proportions which made it possible at any moment for a fall to take place of such dimensions as to displace the gas, causing it to come into contact with the naked lamps, when a terrible explosion would have been the result. The men's lives were in imminent danger from an explosion of gas, even if they had been using safety lamps; for, should a local fall of the roof have taken place, it would have forced the gas out at such a high velocity that the flame of the safety lamps would have been forced through the gauze and ignited the exterior gas. According to the evidence, precautionary measures were not taken to prevent an explosion.

All mine squeezes, general or local, come on gradually, and the indications are always very manifest to the ear or to the eye, such as the cracking of the roof rock before an entire separation takes place and an occasional fall. Loss of life does not necessarily attend a mine squeeze if those whose duty it is to direct will use all precautions to prevent the workmen from working under it.

Usually in such cases squeeze will never occur where the pillar supports are strong enough to sustain the overlying strata. . . . The trouble will be only local where the pillars are formed large enough to sustain the load over them under ordinary conditions.

In course of mining No. 5 vein, every effort had been made to form the chambers and pillars in No. 5 vein over those constructed in No. 6 vein. The map shows that a little over nine acres of the No. 5 vein had been mined before the accident occurred. Mr. Langan, mine superintendent, had directed what size the pillars should be formed in the Twin Shaft mine, and his judgment in this respect was endorsed by Mr. McDonald, mine inspector, who testified that he considered the pillars in that mine large enough.

The report says that the inspectors have examined as much of the Twin Shaft colliery workings as possible, and at the same time acquainted themselves with the method of mining, as shown on the colliery map. They have also taken into consideration what effect the "mud crack" (an extensive natural fissure) would necessarily have on the rock strata. They have noted the absence of large reservation pillars of coal left sectionally throughout the colliery. These have not yet been introduced in connection with coal mining in the vicinity of Pittston. After deliberation they have come to the conclusion that the "mud crack," discovered in front of the bore hole which delocated the roof strata, together with some irregularity in the formation of the pillars and the chambers of No. 5 vein not being all vertically over those in No. 6 vein, was the original cause of the squeeze.

To guard against and prevent a repetition of such accidents as that at the Twin Shaft they suggest for consideration the following:

"1. That reservation pillars of coal be left unmined sectionally throughout each colliery, of such dimensions as will form the position of two breasts or chambers and two pillars with a group of not more than 10 breasts or chambers between two reservation pillars.

"2. Where more than one seam of coal is in operation, reservation pillars of coal shall be formed in each seam, one vertically over the other, and where such reservation pillars have not already been formed in collieries now in operation, the mine inspector shall have power to enforce the same, and no openings other than transportation and ventilating avenues shall be driven through these reservation pillars unless by permission of the district mine inspector.

"3. The coal may be mined from these reservation pillars on giving notice to the mine inspector, but not until final robbing may be begun, and only where the surface conditions will permit of such mining.

"4. Reservation pillars of coal should also be left unmined under surface streams and rivers, the width of the pillar to be in proportion to the width of the stream or river and depth from the surface to the top of coal seam.

"5. A skeleton map of each vein mined in each colliery shall be furnished by the owners, operator or superintendent to the mine inspector, showing the course of all the air currents, intake and outlet, also all the main and distributing doors, and overcasts, and should any important or permanent change be made in the course of the air current, the inspector shall be notified so that the change may be put upon his map.

"6. In collieries generating explosive gas, where the workmen alternately use naked and safety lamps, they shall absolutely use safety lamps."

The reasons given for the first three suggestions are, briefly, that the

effects of a squeeze or an explosion would be confined to a single group of chambers; and that each group could be ventilated separately. As to the fourth, it is simply a precaution against the flooding of the workings by the breaking in of surface streams. The fifth provides a guide in case of the absence, death or injury of the officials in charge of the workings, and ought to be applied everywhere. The last suggestion hardly requires the statement of reasons to support it.

THE COLORADO MEETING OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.

Specially Reported for the Engineering and Mining Journal.

We supplement below from mail advices sent by our correspondents the condensed special telegraphic report given in our columns last week, which noted all the principal points of the meeting.

The session was opened Monday afternoon, September 21st, at 2:30, at the Brown Palace Hotel, and the meeting was called to order by Richard Pearce, chairman of the local committee. Governor McIntire was to have delivered the address of welcome to the visitors, but, owing to the strike trouble in Leadville, was forced to be absent from the opening session. Mr. Pearce extended a hearty welcome in behalf of the citizens and offered the freedom of the city, wishing them a pleasant visit and a useful one.

Secretary Raymond replied, expressing the thanks of the Institute. He said the first time he came to Denver it was by stage coach, and there was just one brick house in the place. The change he found now was something he could hardly realize. In driving about the city he had seen many evidences of financial distress in the shape of magnificent residences. In the East that was not the way financial distress was expressed. But it seemed that here in their despair they had put up all those fine buildings. Denver was peculiarly situated at the edge of the ocean of plains and the continent of mountains, and the products of the mine and the farm were here united; the result had been astonishing. This was the 26th annual session of the Institute, which had in a quarter of a century brought about great results and great development, which had caused trouble in politics, but added great wealth to the world.

Ex-President Pearce was called to the chair, and then Secretary Raymond announced invitations from the Colorado Scientific Society and the Denver Society of Civil Engineers to make their rooms headquarters. A reception at the residence of Chairman Pearce was announced to follow the session, from 5 to 6.

The first paper of the session was on "The Development of Colorado's Mining Industry," which was read by State Geologist T. A. Rickard.

J. B. Grant said the reference had been made to "the collapse of silver mining," and he desired to refute it, for there were as many men as ever engaged in silver mining. He believed that the miners would continue to discover new ore bodies whether silver was 65c. or \$1.25.

Secretary Raymond suggested that the word "collapse" was used in an American sense; that the people were simply standing still with no great strikes, and that was all the "collapse" amounted to.

Mr. Grant added that there was talk of a collapse in 1893, but it did not come; for the smelters handled more than ever in 1893; there was a slight decrease in 1894. He desired to impress upon them that an increase in the price of silver would not greatly increase the output of the mines.

The secretary read a long list of proposed new members, who had been approved by the council, and they were elected to membership. There were a number from South Africa, and the secretary announced that it was a new crop, due to the old members in that section "getting into politics."

A paper prepared by Frank Clemes Smith, of Rapid City, S. Dak., on "The Occurrence and Behavior of Tellurium in Gold Ores. More Particularly with Reference to the Potsdam Ores of the Black Hills, S. Dak."

Professor W. P. Jenney, of Deadwood, gave a résumé of the paper and explained the ore formations of Rapid City, as compared with Cripple Creek. The paper was also discussed by Howard Van F. Furman, of Denver, on the point of analysis and reduction of the tellurium ores.

The next paper was on "Electric Mining in the Rocky Mountain Region," by Irving Hale, of Denver, a summary of which was heard with much interest.

An excursion to Glenwood Springs after the close of the meeting was announced and then the session adjourned until 8:30 in the evening.

In the afternoon a reception was given by Mr. and Mrs. Pearce at their residence on Sherman avenue, which was attended by many members and ladies.

H. S. Chamberlain, of Chattanooga, Tenn., presided at the evening session on the same day. The first paper discussed was one relating to the improvements recently made in the power plant of the Standard Consolidated Mining Company, of Bodie, Cal., by Robert Gilman Brown. The additions include a new dam at the head of the water supply, new motors, new hoists, pumps and other work.

In the discussion Mr. Brown spoke of the curious effects of electric storms upon the wires and electrical apparatus, and described the methods adopted in the way of lightning arresters. He suggested that the possibilities of compressed air may disturb the progress of electrical power appliances in the future.

On this subject J. A. Kebler of the Colorado Fuel and Iron Company, gave his opinion of compressed air as used by his company at the coal mines. He favored electricity.

"Silver Losses in Cupellation," by L. D. Godshall, of Everett, Wash., was read by title. Arthur Dwight, manager of the Colorado smelter, in Pueblo, submitted a sketch of an improved assay muffle in use in Pueblo, which secures better and more accurate results.

Prof. Arthur Lakes, of the State School of Mines, in Golden, submitted his paper on the "Gunnison Gold Belt."

On Tuesday morning, September 22d, a Union Pacific special train conveyed the mining engineers to the Argo smelters. Many ladies were in the party. The delegations from the East and South look upon Denver as a model city and Colorado as the queen of mineral-producing States, and as a consequence felt at home. The special remained at the smelters until noon. The managers of the works escorted their visitors through

the works. In the afternoon the visitors were entertained at Fort Logan by seeing the government troops on dress parade.

On Wednesday, September 23d, the members left Denver by special train for Cripple Creek. The engineers arrived at 4:40 p. m. on a special train over the Midland Terminal Railway, and the visitors instead of being taken to see the mines on Gold Hill, as pre-arranged, were driven through the streets of the city. The burnt, as well as the unburnt, the bright as well as the dark, streets were traversed by 150 persons in 30 carriages.

On Thursday morning, September 24th, the visitors and friends were shown through the tunnel of the Anaconda Company to the extent of over 3,000 ft., then to the Elkton's first level, where a distance of 1,350 ft. was passed through. Thence the train proceeded to Victor, where lunch was served simultaneously at a large restaurant, and at the Portland mine and also at the Buena Vista mine, on Bull Hill. After lunch Buena Vista, Independence, Portland and Gold Coin subterranean workings were explored, and the train and private carriages arrived at Cripple Creek at 6:30 p. m. At 8:30 p. m. a banquet was given to the visiting engineers by the local engineers and citizens of Cripple Creek. At the banquet the following toasts were responded to: "Cripple Creek's Welcome." J. M. Brinson; "The American Institute of Mining Engineers," H. S. Chamberlain; "How to Get In," J. M. Parker; "United States Geologists," Dr. D. T. Day; "Cripple Creek," Francis T. Freeland; "The Brotherhood of Engineering and Law," Dr. R. W. Raymond; "Mining Machinery," Thomas B. Stearns; "The Ladies," O. D. Willcox; "How to Get Out," A. E. Carleton; "Sampling and Samplers," S. M. Taylor; "Self-Development of the Cripple Creek District," Charles J. Moore; "Ore Reduction and Reducers," J. D. Hawkins; "The Law in Mining," J. S. Jones; "Our Sister City, Victor," James Doyle; "Geology and Its Relation to Mining," Prof. Arthur Winslow. E. C. Stimson, of Cripple Creek, acted as toastmaster.

On Friday, September 25th, the visitors inspected the Brodie cyanide mills, at Mound City, and the El Paso chlorination works, at Gillette, and left the latter place at 4 p. m. for Colorado Springs. They arrived at that place two hours later and were received by a committee of citizens consisting of R. J. Bolles, A. L. Deckerman, D. V. Donaldson, George R. Buckman, J. W. Proudfit, J. G. Shields and J. H. Bolles, who met the party at the depot and escorted them to the Antlers Hotel, where a banquet was prepared for them by the members of the Institute who live in this city. After the banquet the Institute was tendered a reception by the members of the El Paso Club, at their club-house on North T-jon street. Mrs. Morley, Mrs. Lunt and Dr. Solly received the visitors at the club-house. It was an elegant reception, and the most interesting feature was the excellent collection of specimens of Cripple Creek gold ores and other ores, which was loaned for the occasion by the following companies: Union, Elkton, Isabella, Mollie Gibson, A. J. Arcadia, Portland, Moon-Anch or and others. The collection consisted of every variety of gold-bearing ore, besides some silver ores. The largest single specimen was from the Mollie Gibson mine, at Aspen, and this was alone worth over \$2,500 at the present price of silver, and was between 95 and 98% silver.

On Saturday, September 26th, a visit was paid to Pueblo. Here visits were made to the steel works and to the smelters, and inspections made. After these visits a reception and supper were given at the Minnequa Club. On the way to Pueblo in the morning a stop was made at Florence, where the oil wells and refinery were examined.

From Pueblo most of the members returned to Colorado Springs or went to Manitou to spend Sunday, a few returning to Denver.

On Monday morning, September 28th, 80 members and a number of ladies proceeded by special train from Denver to Black Hawk, where, after visiting some of the mills, they were transferred to a special train of ore cars on the Gilpin Tramway Company's line and taken for a ride of 25 miles over the hills of Gilpin County. Many of the prominent mines of the district were passed, and when the Saratoga mine was reached a stop was made for lunch. Here, also, such members as wished were given an opportunity to go underground. Returning to Black Hawk, the party took their special train for Golden, where supper was served at the Colorado State School of Mines.

After an inspection of the buildings and collections of the school, the fourth and last business session of the meeting was held in the geological lecture room. The papers presented at this session were: "The Cyanide Process in the United States," by G. A. Parker; "Laboratory Tests in Connection with the Cyanide Process," by H. Van F. Furman, and a lengthy and valuable paper on the "Solution of Gold in Potassium Cyanide and the Precipitation of Gold from Cyanide Solutions," by Prof. S. B. Christy. Messrs. Brown, Wilkes and Furman discussed the last-named paper.

After a unanimous vote of thanks to those who had rendered the sojourn of the members in Colorado a delightful experience, the meeting finally adjourned. Several of the members and ladies left on Tuesday morning for a special trip to Glenwood Springs and Aspen. This party left Denver for the East Thursday night. Most of the members who were unable to join in this excursion left Denver for their homes on Tuesday.

We give below abstracts of some of the papers read at the meeting:

ACTION OF BLAST-FURNACE GASES ON VARIOUS IRON ORES.

BY G. O. LAUDIG.

This paper gives the result of a number of experiments upon different iron ores made in the laboratory of the Buffalo Furnace Company, the object being to throw some light on the causes of difference in the facility with which ores are reduced. The results are given by the author in two large tables, showing the changes in the ores produced by submitting them to the action of blast-furnace gases in apparatus devised by Mr. Laudig; the differences in the various ores, due to their composition, and also to their mechanical condition, fineness, etc.

MICROSTRUCTURE OF STEEL AND CURRENT THEORIES OF HARDENING.

BY ALBERT SAUVEUR.

In this paper the author continues the line which he has been pursuing in connection with Mr. H. M. Howe, and discusses the behavior of steel when heated and then cooled either slowly or suddenly. It is hardly possible to condense the paper or follow its argument without giving the numerous diagrams and tables which accompany it. It is divided into two parts, the first treating of the changes in the microstructure of steel which occurs during slow cooling in steels containing various

amounts of carbon. The second part is devoted to an examination of the bearing such structural changes as occur at the critical points in cooling have upon the current theories of hardening. The writer does not advance any new theory, but simply records the facts he has observed.

GOLD IN THE GUIANAS.

BY HENRY G. GRANGE.

The writer says that the Guianas include British, or Demerara, Dutch, or Surinam, French, or Cayenne, and the disputed territory, or that portion of Brazil on the northeast coast of South America. After passing the picturesque mountainous coasts of Colombia and Venezuela, one reaches a low, flat mud-bank which extends far out into the sea, so that from the steamer, over a couple of leagues of turbid, shallow water, one can just see the dismal outline of the pestilential "bush" that fronts the Caribbean Sea, clear around to the mouth of the Amazon. Here, in the order mentioned above, are the Guianas.

Gold-mining in the Guianas is altogether placer-mining, and is of the same general nature throughout. The product of this section is about \$3,000,000 to \$4,000,000 annually, mostly from Demerara, not because of superior richness of its placers, but as a result of its very much larger population, which exceeds twice the aggregate census returns of both Surinam and Cayenne. Mining in all this section is of comparatively recent date, and is indirectly due to the decline of the sugar industry, throwing many men out of work. The different districts are described in detail, and many interesting particulars given in relation to their history and exploitation.

THE OCCURRENCE AND BEHAVIOR OF TELLURIUM IN GOLD ORES.

BY FRANK CLEMES SMITH.

This paper says that tellurium, discovered by Muller von Reichenstein in 1781, is generally classed as a very rare metal; it is further mentioned by one of our late writers as "of comparatively little importance," and as obtained from its ores by a "complicated process." Its commercial importance, particularly in connection with electrical appliances, has been passed upon by Mr. Edison; and it is certain that in some metallurgical processes for the treatment of gold and silver ores, it may be saved as a by-product at a relatively reasonable expense.

The discovery of tellurium in the Potsdam ores of the Black Hills was first made in the course of an examination of some samples from the Welcome mine, belonging to the Horse Shoe Mining Company. With the idea that this metal, if of general occurrence in the Potsdam ores, would go far to explain the source of their mineralization, and that it must also exert a very notable effect upon their metallurgy, a large number of samples, from various locations in the hills, were examined, and, of all these ores, including several mineralized dike rocks from the vicinity of Potsdam ore bodies, but one sample failed to show the presence of tellurium.

Mr. Smith gives an account of tests and assays of tellurium ores in detail and concludes with a description of the effect of tellurium upon the various cyanide and chlorination processes for the treatment of gold ores.

A MODERN SILVER-LEAD SMELTING PLANT.

BY L. S. AUSTIN.

The author says that the successful plants in the West were at first erected on a small scale, and, as their business has been built up, have been added to gradually as their limitations permitted. They have had to adapt themselves later to their circumstances, making the best of drawbacks, and putting up with much which, had it been originally allowed for, would not now impede them. For such a plant as is now proposed, it is assumed that a site will be chosen possessing natural advantages which may be utilized to their full extent, and which, at the same time, may allow for future extension. The arrangement of a plant on a terraced site has been generally considered the most advantageous; but many advocate a level site, claiming that it permits expansion and is convenient in many respects. Even in the case of a plant treating, say, 500 tons of material per day, and saving by terrace-arrangement 40 ft. of fall, the total theoretical saving is barely one horse power. We have on the one side, then, the level site, involving the cost of installing and operating elevators, with their attendant liability to accident, but possessing the advantages of good ventilation, accessibility and compactness of plant; and, on the other hand, the side-hill system, with fewer elevators (they cannot be done away with altogether), increased first cost of excavation and retaining walls, less accessibility, poor ventilation and greater extension of plant. The writer is disposed to advocate a modification of the latter plan, utilizing an extended surface with a moderate slope.

The duplication of parts in a smelting-plant is, of course, very important, since delays, even for a few hours at a time, may soon occasion a greater loss than the cost of duplicating the machinery which has caused the delay. It is accordingly better, for example, to put in two cheaper and less economical engines, to insure against a shut down, than one larger engine which uses proportionately less fuel, but which must be occasionally stopped for adjustment or repairs. In a plant, especially if erected upon the terrace system, the machinery-cost is not a large fraction of the total. It would, therefore, seem wise to have each machine the best of its kind, to duplicate it freely, and, by adopting the level system of building, to save the costs of extensive excavation, retaining walls, etc., which constitute so much of the first cost of the plant, and which may occasion subsequently a heavy bill for repairs. The author then proceeds to outline the details of a plant embodying the latest improvements in design and appliances.

The X-Rays and Envelopes.—Every new scientific discovery starts the course of invention. According to the *Papier Zeitung* two Vienna inventors, Messrs. Theyer and Hardmuth, have applied themselves to the manufacture of an envelope in which letters shall be secure from photography by the Roentgen rays. The X-ray proof wrapping so far most approved is of heavy paper with a lining of bronze. Another form has bronze ornaments on the outside so closely placed as to protect the letter within. The coating of bronze, electrically deposited, is extremely thin, and but little heavier than the paper.

THE REDUCTION PLANT FOR PYRITIC GOLD-BEARING ORES, AT GIBBONSVILLE, IDAHO.

Written for the Engineering and Mining Journal by Bernard MacDonald.

This is a modern plant now successfully employed in the extraction of gold from its ores, especially the base and refractory ores. In order to lay the foundation for an adequate conception of the factors making up the problems presented for solution in the design and operation of the plant, a brief description of the mines is given.

THE MINES.

The mines are situated at the town of Gibbonsville, Lemhi County, Idaho, six miles west of the summit of the Rocky Mountain range, where the Bitter Root range spurs off, about 35° 34' North latitude, and 114° 6' West longitude (Greenwich), at an altitude of 4,400 ft. above sea level. Gibbonsville is marked on the maps of the United States and of Idaho. The railroad shipping point is Divide Station, on the Utah & Northern Railroad, 27 miles south of Butte, Mont., 80 miles distant from the mines. From this station a good wagon road, generally speaking, leads to Gibbonsville.

The veins are true fissures, cutting across the highly-tilted strata of the slate formation. They occur in one system and are substantially parallel. Their strike is east and west, dip about 70° to the north, width varying from a few inches in some up to 12 ft. in places in others. The ore consists of quartz and quartzified slate, streaked and impregnated with about 8% of iron pyrites. The iron pyrites contain all the value, of which over 99% is gold, the remainder being silver. The developments were sufficiently extensive to warrant the calculation that a production of 100 tons daily of \$10 ore could be relied upon, costing less than \$3 per ton for mining, development and delivery at the mill.

THE PLANT.

The plant has ample capacity for the crushing and concentration of 100 tons of crude ore, and the roasting and chlorination of 20 tons of concentrates daily, using in the operation a combination of processes in three departments, as follows:

Section 1.—Stamp crushing, with amalgamation of free gold on copper plates, followed by hydraulic classification of the pulp, and subsequent concentration of the sulphurets of Frue vanners.

Section 2.—Dead roasting of the sulphurets in a Pearce turret furnace, with a roasting oven annex.

Section 3.—Chlorination of the roasted sulphurets in revolving barrels, and precipitation of the metallic gold from the chlorine solution.

Section 1, Stamp Mill.—The first department of the plant is the ordinary stamp mill of the California type, containing the modern automatic devices for minimizing labor, with certain modifications especially designed for the crushing, amalgamation and concentration of pyritic ores. The building inclosing this section is 64 × 140 ft., built on a side hill, with 95 ft. fall between the top of receiving bins and vanner floor. The foundation timbers of the building are set on solid rock, and bolted thereto, as are also the foundation timbers of the supporting frames of the heavy machinery. In operation, the ore delivered from the mine falls into the receiving bins of the mill. From these it passes by gravity, as permitted by the crusherman, through the gates, over grizzlies—bar screens with 1½-in. spaces. By this operation it is divided into two sizes, one larger, the other smaller than 1½ in. The ore is further reduced by passing automatically through a Blake crusher, a trommel screen, and a pair of 36 × 14 Cornish rolls, to a size under 1 in. Thus reduced, the ore is delivered to the storage bins behind the batteries, which have a capacity of 300 tons. From the bins, the ore gravitates to improved Challenge feeders, which feed it automatically, as required by the batteries.

The mortars of the batteries are of the narrow, double-discharge type,



GIBBONSVILLE, IDAHO, AND THE REDUCTION WORKS.

The mines are operated through cross-cut adit tunnels, which undercut the veins to the depth of 600 ft. below their outcrop. Cord wood costs \$2.25 per cord delivered; charcoal, 13½c. per bushel; mining timbers, 2½c. per lineal foot for 8 and 12 in. logs, and lumber costs \$6.50 per thousand. A four-drill air compressor, run by water, furnishes power for the machine drills used in drifting. Wagon transportation of mining and domestic supplies cost 1c. per pound, over the prices that the same can be laid down for at Montana common points. Miners' wages are \$3 per day; common labor, \$2.50, and carpenters \$4. The reduction plant is 4,500 ft. distant from the ore bins at mouth of main working tunnel.

From the foregoing, it will be seen that the product to be treated amounted to about 100 tons daily of ore having an average value of \$10 per ton and carrying about 8% of iron pyrites. By repeated experiments it had been ascertained that the ore would yield 40% of its value to plate amalgamation when crushed to a pulp flowing through a 30-mesh screen. Viewed from a commercial standpoint, it was estimated that the 40% of value recovered by amalgamation would fully meet all the costs of mining and reduction and the fixed charges of operation, and that the fight for profits would have to be made on the 60% of value locked up in the refractory pyrites after the pulp had been subjected to plate amalgamation and relieved of its free gold. Briefly stated the proposition was: (1). Yield of 100 tons of pyritic ore daily. (2). Containing a value of \$10 per ton. (3). Yielding 40% of its value to free milling. (4). Sixty per cent of value, or \$6 per ton, remaining after amalgamation. (5). The profits to be the amount recoverable from the \$6 pulp. (6). Freight on concentrates to railroad points, plus smelting charges, \$30 per ton.

In the spring of 1885 the economic solution of this problem was undertaken by the writer, who was then managing the business of the American Developing and Mining Company, the owner of the mines. After a careful consideration of all conditions, a reduction plant, as described in this paper, was designed and constructed, and has, during the past year's operation, proven a success.

having the front and rear screens inclined outward at an angle of 17°. They are thus designed to facilitate the rapid crushing and delivery of the pulp, so as to prevent sliming of the sulphurets in stamping. The screen used is 30 mesh, 29 wire, Tyler steel wire battery cloth. The stamps, 30 in number, weigh 950 lbs. each, with a drop of 6 to 7 in., 94 times per minute. On issuing from the battery, the pulp flows over silver-plated copper plates, set on tables with grade of 1½ in. to the foot. On these the free gold in the pulp is caught. After passing over the plates, the pulp from the 30 stamps flows in launders to three sets of Brown's hydrometric sizers for classification. In each of these sets, five classifications, ranging from 30-mesh to slimes, are made. Thus classified, the pulp flows to 15 six-foot Frue vanners, divided into three sets of five each, corresponding to the sizers. The vanners of each set are adjusted for the concentration of the special classification of the pulp they are to receive. This arrangement is giving very satisfactory results in the saving effected by the vanners, as the loss in the tailings seldom reaches as high as 7 per cent. of the gross value of the ore.

Section 2, Roaster.—The building covering this section is situated directly in front of and 50 ft. distant from the vanner room of the stamp mill. The main building has a ground area of 64 × 64 ft., and is 28 ft. high to the eaves. Lean-tos for annex and cooling floor cover an area of 64 × 30 ft. and 64 × 24 ft. As already stated, the furnace is the Pearce turret furnace, with roasting oven annex. In operation, the concentrates are dumped into the elevator boot below the floor, from which they are raised to the storage bin near the roof by a belt and bucket elevator. From this bin, the concentrates deliver by gravity through an iron chute, to an automatic feed hopper, which is adjusted to feed the furnaces as desired.

In the furnace, while being roasted, the concentrates are mechanically stirred and carried around by rabble arms to the discharge. They are now charged into the roasting oven, where they are subjected to a strong reducing heat until the final traces of sulphates remaining in them are

decomposed. They are then discharged, dead roasted, wet down, and delivered to the cooling floor.

Section 3, Chlorination.—The building inclosing this section has a ground area of 146 × 34 ft. and parallels the stamp mill on the side hill, but it separated from it by a space of 12 ft. Owing to this position no elevators are required except the drum hoist used in hoisting the roasted concentrates from the cooling floor of the roaster to the storage bins in this building. From the storage bins the roasted concentrates feed through chutes to the charging hoppers over the chlorination barrels, where measured charges of 1½ tons each, the capacity of the barrels, are made. When required, these charges are drawn from the feed-hoppers into the chlorination barrels, where the chemicals necessary to generate the chlorine gas and sufficient water to make an easy-flowing pulp are added. The barrels are then closed, set to revolve 15 times per minute for three hours, the time in which the full effect of the chlorine gas is obtained. The chlorination barrels, of which there are two, are charged alternately, so as best to occupy the time of the attendants. When their charge is chlorinated they are stopped, their contents are drawn off into filter barrels, there being one of the latter below each of the former. When empty the barrels are hosed out, recharged with pulp and chemicals, and revolved as before.

The chlorinated pulp and solution are now in the filter barrels, which are closed and compressed air applied. This application quickly forces the gold solution from the pulp through the filter heads of the barrels, from whence it is conducted through lead pipes to the solution storage tanks.

After the filtration of the solution is thus effected, the pulp is washed by introducing clean water, which is filtered through the pulp and conducted to the storage tanks, as before, until a simple chemical test shows such wash water to contain no gold. The barrel is then revolved and the pulp discharged into the waste sluice underneath, from whence it is flushed to the tailings dump by water. The filtered solution, including the wash water in the storage tanks, is drawn off and distributed to the precipitating tanks, where the precipitation of the gold is effected by the addition of ferrous sulphate. The liquor, being now worthless, is run to waste, and the tanks refilled with fresh solution from the storage tanks, and the precipitation of the gold contained effected as before.

The gold precipitate is allowed to remain on the bottom of the tanks and receive additional precipitations, in a similar manner to that described, until the regular clean-up day, when the accumulated precipitates are carefully drawn off into buckets, poured into the clean-up tank, washed, filtered, dried, melted and cast into bars. The gold bars thus produced average about .995 fine—almost chemically pure.

The entire plant is run by water power and lighted by electricity. The power is generated by two Pelton wheels under an effective head of 82 ft., one wheel running the vanners and dynamo, the other all the rest of the machinery.

COMMERCIAL RESULT.

As will be seen from the foregoing description, the gold is recovered by two processes (1), amalgamation of free gold on copper plates, and (2), the chlorination of the roasted concentrates. A year's operation of the mill has demonstrated that a fraction over 40% of the value in the crude ore has been saved by amalgamation, and about 53% of the gross value has been saved in concentrates, 7% being lost in the tailings. In the chlorination of these concentrates, when roasted, a saving of 95% is effected. Allowing 1% for mechanical losses, a recovery of 94% of the values in the concentrates is made; 94% of the 53% total value of the concentrates would be 49.8% of the total value in the crude ore. Hence of the total in the crude ore we have a saving of 89.8% by both processes. That is, a total recovery of \$8.98 from each ton of \$10 ore, or \$898 from each day's run of 100 tons. From this amount the expenses of mining and reduction of the ore are of course to be deducted, when the remainder will be profit.

The cost of mining and delivering the ore at the mill is \$3 per ton. The itemized statements of the cost of reduction in each section of the plant are as follows:

Stamp milling and concentration, per 24 hours.	
Labor.	
1 crusherman.....	\$3.00
2 amalgamators.....	7.00
2 vannermen.....	6.00
1 wheeler, etc.....	3.00
¼ oiler, etc.....	1.50
¾ machinist.....	1.34
¼ carpenter.....	2.00
¾ night watchman.....	1.09
¼ foreman.....	1.66
¼ assayer.....	1.00
Total daily labor.....	\$27.50
Supplies Consumed.	
Castings, lumber, etc.....	\$10.00
Oil.....	1.00
Screens, 2c. per ton.....	2.00
Quicksilver, tacks, belt, etc.....	.50
Total daily supplies.....	\$13.50
Total cost.....	\$41.00
Cost per ton of crude ore.....	\$0.41
Roaster with daily capacity of 20 tons.	
Labor (per 24 hours).	
4 roastermen, 12-hour shifts.....	\$12.00
1 woodman.....	2.50
2 laborers.....	5.00
¾ night watchman.....	1.00
Repairs and occasional blacksmith work.....	2.00
¼ foreman.....	1.66
¼ assayer.....	1.00
Total daily labor.....	\$22.50
Labor (per 24 hours).	
¾ machinist.....	\$1.34
Total daily labor.....	\$23.84
Supplies, 6 cords wood at \$2.25.....	13.50
Total expense of roasting.....	\$40.00
Expenses per ton.....	\$2.00
Chlorination; duty, 15 tons roasted ore daily.	
Labor (per 24 hours).	
3 chlorinators.....	\$9.50
2 laborers.....	6.00
¼ foreman.....	1.66
¼ assayer.....	1.00
¾ machinist.....	1.34
¾ night watchman.....	1.00
¼ carpenter.....	2.00
Total daily labor.....	\$22.50
Supplies for chlorinating 15 tons of roasted concentrates, the product of 20 tons of raw concentrates:	
Chloride of lime, 12 lbs. at 5 cts. per pound.....	\$0.60 per ton
Sulphuric acid, 18 lbs. at 3½ cts. per pound.....	0.63 " "
Total cost of supplies.....	\$1.23 per ton
15 tons at \$1.23 per ton.....	\$18.45
Sundries, including hose.....	1.00
Total cost of supplies.....	\$19.45
Total cost of chlorinating 15 tons.....	\$41.95

From the above it will be seen that the total daily cost of roasting and chlorinating 20 tons of raw concentrates is \$81.95, or \$4.09 per ton, with a saving of 94% of the assay value, \$25.91 per ton over the realizable value of the concentrates if shipped to the nearest smelter.

As these sections have the capacity to treat about double the amount of concentrates resulting from the milling of 100 tons of crude ore, by reason of which they are in operation only about half time, unless treating custom lots of concentrates, the average daily cost of these sections, including repairs, will be one-half that given above, which was for full capacity and continuous operation. Therefore an equalized statement of the daily cost would be: Mill, full as given above, \$41; roaster, one-half figures given above, \$20; chlorination, one-half figures given above, \$20.97; making the daily average cost amount to \$81.97, or about 82c. per ton of crude ore.

From the foregoing, the following statement is deduced as the result of one day's operation, the unit of calculation:

100 tons at \$10 per ton.....	\$1,000
Cost mining and delivering 100 tons at mill.....	\$300
All losses of concentration and chlorination, 10%.....	102
All treatment costs.....	82
Net Profit.....	516
	— \$1,000

The photographs herewith reproduced will in a measure illustrate the plant and conditions described. They include a general view of Gibbonsville and the works, and a view of the ore-trestle, some of the buildings and also the mine openings.

THE PREPARATION OF ALUMINA FROM BAUXITE.

By James Sutherland.

The British Aluminum Company has established works at Larne Harbor, in Ireland, where the bauxite obtained from its beds in the County Antrim is freed from its impurities, the alumina obtained being sent to the factory in Scotland, where the metallic aluminum is turned out. The County Antrim bauxite contains: Alumina, 56%, corresponding with aluminum, 29.9%; peroxide of iron, 3; silica, 12; titanitic acid, 3, and water, 26%. From this analysis it will be seen that, if the aluminum is to be obtained in a state of purity, the peroxide of iron, silica and titanitic acid must be separated before the extraction of the metal from the alumina is attempted.

The most convenient method for obtaining pure alumina from bauxite is that discovered by Dr. K. H. Bayer, which is used in the alumina factory at Larne Harbor, and which is described in a paper recently read before the British Institution of Mechanical Engineers. The factory is connected by rail with the mines at Glenravel, 35 miles distant. The main building is 240 ft. long and 80 ft. broad, the loftiest portion being 30 ft. high; it is built of brick and covered with a slated roof on iron principals, in two bays of 40-ft. span each. Steam at 100 lbs. pressure per square inch is generated in two Lancashire boilers, 25 ft. long and 8 ft. diameter, fed by a direct double-acting duplex steam pump, with pure water at 180° Fahr. obtained from the evaporating apparatus. The necessary draught is obtained by a chimney 120 ft. high. The driving power required is supplied by a horizontal non-condensing engine, with cylinder 14 in. diameter and 20-in. stroke, capable of exerting 80 H. P. when working against a back pressure of 10 lbs. This amount of back pressure is due to the exhaust steam assisting in the heating of the evaporating apparatus. The power is transmitted to the main shaft, which runs at 200 revolutions per minute, by four 5½-in. cotton ropes driving on the flywheel, which is grooved for the purpose.

The trucks of bauxite as received from the mines are run directly into the grinding-room. Here the ore is fed into a disintegrator, and ground to ¼-in. cubes, which fall down a shoot into the bottom boot of an elevator, whereby they are delivered into a riddle of ¼-in. mesh. The ore which passes through the mesh descends a sheet-iron pipe into the calciner; while the tailings are returned to the disintegrator by gravitation, to be ground over again. The organic matters present in the ore require to be destroyed; and for this purpose calcination is resorted to. The calcination is important, because the presence of organic matters would retard, if not totally prevent, the subsequent separation of the alumina from the caustic soda in the decomposing cylinders. On the other hand, too great heat would cause the ore to become far less soluble in the solution of caustic soda.

The calciner consists of an iron tube, 33 ft. long and 2½ ft. diameter, lined with fire-brick, and mounted on rollers to permit of its revolving. It is inclined at an angle of 1 in 25, and is heated by a furnace at the lower end, from which the heat passes up through the tube and into a chimney at the higher end. As the tube revolves, the bauxite fed into the higher end travels downhill toward the lower end and meets the heat ascending from the furnace, which is regulated to suit the extent of calcination required. On leaving the tube the calcined ore falls upon a plate having a slot in it just large enough to allow the bauxite to pass. Through the slot it descends by a chute into the cooling tube, which is 30 ft. long by 2½ ft. diameter, and also revolves, being inclined in the opposite way to the calciner tube. Here the ore is cooled by a current of air drawn through the tube by a fan connected with an opening. At the outfall of the cooling tube is placed a spiral conveyor, which discharges the ore into a second disintegrator, where it is ground sufficiently fine to pass through a 30-mesh sieve. Thence an elevator deposits it in a store having a hopper bottom, underneath which the small trucks can run to be filled.

The alumina is extracted from the ground bauxite by treating it with a strong solution of caustic soda under pressure. A soluble compound of alumina and soda, called aluminate of soda, is thereby formed, while the peroxide of iron, silica and titanitic acid remain as insoluble compounds. This decomposition is effected in pressure kiers, which are constructed of mild steel plates ¼-in. thick, and are 11 ft. long by 5 ft. diameter inside, and surrounded with a steam jacket for heating. A horizontal 3-in. shaft runs through the kier longitudinally, and is fitted with eight 16 in. × 9 in. paddles, which keep the contents in constant agitation. Stuffing-boxes are fitted at the ends of the kier for the shaft to run in. Each kier is provided with a charging and a discharging opening, and a

safety valve; and the jacket with steam inlet, safety valve and water outlet, the latter being connected with a steam trap. The kiers have been tested to 200 lbs. per square inch, and are constructed to work at 100 lbs., although in practice about 80 lbs. is found to be sufficient for effecting the decomposition of the bauxite.

The necessary supply of caustic soda solution having been run in, the agitator is set going, and the bauxite previously weighed is admitted. This is done by a small elevator, which supplies the quantity automatically and regularly, thus insuring thorough admixture. When the charge is all filled in, usually about three tons, the charging opening is closed, and steam is turned on into the jacket. The pressure is slowly increased up to 70 or 80 lbs., which is maintained for two or three hours, until the decomposition is complete. The discharge cock is then opened, and the mass is blown out by the pressure in the kiers up into the red mud tanks, which are placed in the highest part of the building. Here the mass is diluted with washing water to a specific gravity of 1.23, and is then ready to be filtered in order to separate out the aluminate of soda solution from the impurities.

The filter presses used for this purpose each contain 50 chambers, giving cakes 30 in. square and 1 in. thick. The impurities being insoluble are

tion is necessary if the alumina is to be produced in a state of purity.

For the separation of the alumina from the soda the decomposition of the aluminate was formerly effected by blowing carbonic acid gas through the liquor, when the soda combined with the carbonic acid, forming carbonate of soda, and the alumina were set free in the form of hydrate of alumina. The carbonate of soda had afterward to be retransformed by a chemical process into caustic soda, before it could again be used for decomposing a fresh charge of bauxite. By the Bayer process the separation of the hydrate of alumina is brought about by the addition of excess of hydrate of alumina itself, and constant stirring in the decomposing cylinders, which are large circular tanks 13 ft. diameter and 20 ft. high, provided with agitators. In practice the liquid aluminate of soda from the cellulose filters is pumped up into large tanks of 4,800 gallons capacity, placed above the decomposers. The liquor can be measured and heated, if necessary, in the tanks. The decomposer, in which sufficient hydrate of alumina has been allowed to remain for beginning the decomposition, is filled, and the agitation started. In about 36 hours 70% of the alumina in combination with the soda has separated out; and this is the extent to which the precipitation usually takes place. The agitator is then stopped and the contents of the decomposing cylinder are allowed to settle. In a



Compressor Building.

Smith Shop.

Ore Bins and Dump.

GIBBONSVILLE REDUCTION WORKS, IDAHO.

retained in the press, while the liquid aluminate runs out into the filter tanks. When the press has become filled with red mud, the cakes before being removed from it are subjected to a systematic washing, for extracting as much of the aluminate of soda as possible. The washing water is utilized for diluting the mass blown up from the kiers. Centrifugal pumps are employed for charging and washing the presses. Conveyors are placed beneath each filter press, which receive the cakes of red mud when the press is opened, and deposit them on trucks placed outside the building. At present the red mud is useless, but experiments are being conducted which it is hoped will result in a profitable use being found for what would otherwise be a troublesome by-product.

The lyes from the filter presses, collected in the filter tank, are then subjected to another filtering process through cellulose consisting of paper makers' wood pulp. These filters are composed of lead-lined vats with sloping sides, 10 ft. long by 6 ft. broad and 3 ft. deep, with a ledge round the inside 6 in. from the bottom, on which is placed a sieve of $\frac{1}{4}$ -in. mesh, supported on a frame. Two of these filters form a set, one placed above the other. About 50 lbs. of cellulose is boiled with water to a thin pulp, and is run upon the sieve in each filter; it soon settles down, and is ready to receive the lyes, from which it retains all the finely divided insoluble particles that have escaped from the filter presses; the result is a perfectly clean liquid composed of pure aluminate of soda. This final filtra-

tion short time the hydrate of alumina settles to the bottom, and the clear liquor is run off the top by gravitation into the weak liquor tanks.

After as much as possible of the clear liquid has thus been decanted off, the hydrate of alumina is pumped out of the decomposing cylinder, sufficient being allowed to remain behind in the cylinder for beginning the decomposition of the next charge of liquor admitted. The hydrate of alumina pumped out is filtered through filter presses, and the weak liquor passing through the cloth is allowed to run into the weak liquor tanks. The charging of the hydrate filter presses is done by a horizontal twin direct-acting steam pump, with steam cylinders 7 in. diameter, rams 5 in. diameter and 12 in. stroke. The pump is provided with an automatic arrangement for shutting off the steam when the presses are full; a $\frac{1}{4}$ -in. pipe leads from the air vessel, and when the pressure exceeds 80 lbs. it raises a weighted diaphragm, which closes a valve placed in the steam pipe beneath the throttle-valve, and so cuts off the steam.

When the filter presses are full, washing is commenced, in order to remove the last traces of soda. The pump for this purpose is duplex direct double-acting, with $5\frac{1}{2}$ -in. steam cylinders, $3\frac{1}{4}$ -in. pump cylinders and 5 in. stroke. The washing is done systematically as before, in five different stages, the last of which is with pure water. After washing, compressed air is forced through the cakes to remove as much water as possible. The air compressor is horizontal, with steam cylinder 8 in. diam-

eter, air cylinder 6 in. diameter, and stroke 14 in. It has a suction capacity of 90 cu. ft. per minute when running at 120 revolutions per minute and delivering at 80 lbs. pressure per square inch. The air-compressing cylinders are provided with water-jackets to keep them cool.

Conveyors are placed beneath the hydrate presses, which deposit the hydrate of alumina on the top of the calcining furnace, where the moisture and water of hydration are driven off. The furnace has a bed 20 ft. long and 6 ft. wide, and is fired with Dowson gas, for which the generator is placed in a small shed outside the main building, so that no dust may get mixed with the alumina. The products of combustion pass between the arch over the hearth and a drying tray placed above, on which the hydrate gets a preliminary drying before being admitted to the hearth. A low temperature is sufficient to drive off the moisture and the water in chemical combination, leaving the alumina perfectly anhydrous; but if formed in this way it takes up water again readily. To prevent it from doing so, the anhydrous alumina is heated to about 2,000° Fahr., when it becomes crystalline, in which state it is not so liable to absorb moisture. It is important to have the alumina as dry as possible, for the presence of water means a corresponding loss of electricity during the subsequent reduction. When the calcination is complete, the alumina is drawn into iron barrows, and spread on a tiled floor to cool; after which it is ready to be packed in casks.

The weak soda liquors from the decomposers and hydrate presses, having a specific gravity of only 1.2, are too dilute to dissolve the alumina out of the bauxite, and must therefore be concentrated by evaporation up to 1.45 specific gravity. The evaporator is of the triple-effect kind, and is capable of evaporating 33,000 gals. of water in 24 hours. It has independent feed, air and circulating pumps, and the exhaust steam from these, as well as that from the main driving engine, assists in heating the evaporating pans. The circulating water is discharged into a small concrete tank or pond, whence it is pumped up by a 5-in. centrifugal pump to the top of the cooling tower, which is 30 ft. long, 20 ft. wide and 25 ft. high, and is provided with four trays. During its descent into the pond the water is reduced 40° in temperature, from 100° down to 60° Fahr. The water evaporated from the weak soda liquors being pure, and having a temperature of 180° Fahr., is used for washing the hydrate of alumina, and for boiler feeding, etc. It is stored in a lead-lined wooden tank of 6,000 gals. capacity, placed above the decomposers; the supply for the hydrate washing is filtered through a small cellulose filter placed beneath. All the drainage of the factory is collected in a concrete tank placed in the yard, and is pumped back, to be used for washing the red mud, dissolving soda, etc. Any soda, aluminate of soda or water which escapes by leakage or otherwise from any of the processes is thus saved. The pump for this purpose is similar in size and make to the boiler feed-pump; it is placed in the boiler-house, and is arranged to feed the boilers in case of a breakdown of the feed-pump proper.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

ROYALTY UNDER MINING LEASE.—S. leased land to another for the purpose of mining iron supposed to be there, but which had not been developed; the lessee to have the right to mine ore for 15 years; to pay 60c. per ton for every ton of ore sold from the premises during that time, to be paid monthly; the minimum to be not less than \$400; the lessee, however, in case the royalties on the iron did not amount to the minimum, to have the privilege of taking out ore in another year to equal the deficit. The lessee assigned the lease to another party on similar conditions, with the addition of 17½c. per ton royalty on 1,000 tons per annum, to be paid whether he mined ore or not. The court held that the ore being exhausted, he was not bound to pay any royalty.—*Boyer vs. Fulmer* (35 Atlantic Reporter, 235), Supreme Court of Pennsylvania.

FRAUDULENT REPRESENTATIONS IN SALE OF OIL LANDS.—The defense of fraudulent representations as to producing capacity of oil lands, interposed in an action for the balance of the purchase money for the lands, must be sustained by convincing evidence to be worthy of consideration, where the party buying had made payments for 27 months, got an extension for a note coming due 30 months after the purchase, bought out the interest of his partners, and made no complaint about the purchase till he was sued for the balance due. On the question of misrepresentations as to production when the well was put into the "shut-down movement" seven months before the sale, evidence of the amount of oil credited by a pipe line to the seller of the lands two years prior to the sale is not admissible, such evidence not showing production, but delivery for market.—*Straight vs. Wilson* (35 Atlantic Reporter, 230), Supreme Court of Pennsylvania.

Acetylene and Air Mixtures.—The behavior of mixtures of air with gradually increased proportions of acetylene, when brought into contact with flame, were studied by a method recently described by Mr. Frank Clowes before the London Chemical Society. The method enables mixtures in varied and accurately known proportion to be rapidly prepared. The proportion of acetylene was progressively increased from 1 to 82%. The mixture containing 3% of acetylene was the first which was affected by contact with the flame placed either above or below. A pale green flame slowly traversed the mixture, showing that it was feebly explosive. As the proportion of acetylene was increased, the rapidity of combustion increased, and even a small volume of the mixture gave decidedly explosive effect. When 22% of acetylene was present, the explosive combustion of the mixture was attended with a slight separation of unburnt carbon. As the proportion of acetylene was increased the separation of carbon was more marked. The limit of explosibility, as judged by the flame traversing the mixture, was reached when 81% of acetylene was present.

Device to Prevent Overwinding.—At the Brilliant & St. George Mine, Charters Towers, Queensland, an ingenious device to prevent accidents from overwinding is in use. The appliance is composed principally of a solid block of timber, which is fixed on the brace and extends right across the shaft, and is called the tumbler. The tumbler is held in position by

a bolt, which is fixed on the guide which separates the two hauling compartments. There is a rod some 4 or 5 ft. above the bolt, with two arms on the top, extending about 8 in. over the hauling compartments. This rod, which is also fixed on the guide, is linked on to the bolt. When the skip ascends in either of the two compartments, and is hauled beyond the required height, it comes in contact with one of the arms of the rod, which loosens the bolt that keeps the tumbler in position. The tumbler is then pushed forward by two heavy springs and is ready to receive the descending skip in a groove in the middle of the tumbler. It is claimed that, the appliance being so simple and inexpensive, its adoption at the majority of mines is probable.

PATENTS RELATING TO MINING AND METALLURGY.

United States.

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

WEEK ENDING SEPTEMBER 22D, 1896.

- 567,959. **PROCESS OF TRANSFORMING CHEMICAL ENERGY OF FUEL INTO ELECTRICAL ENERGY.** Wilhelm Borchers, Duisburg, Germany. The process consists in placing a bath of cuprous chloride in a closed circuit, dissolving fuel-gas in the bath of cuprous chloride at one point and dissolving oxygen of the air at another point in the bath.
- 567,978. **STEAM PUMP.** Albert F. Hall, Boston, Mass. The combination of a main engine, including a cylinder, steam-chest, and inlet and exhaust ports, a main valve in the steam chest, a reciprocable auxiliary valve-piston to move the main valve, and an actuator operated from the main engine, directly engaging and having a sliding connection with and to rock the valve-piston, to thereby control its reciprocation.
- 567,986. **OXIDIZING PYRITE-SMELTING FURNACE.** John S. Loder, Denver, Colo. The combination with the body portion of a hood and flue mounted thereon, tuyeres entering at the base of the body portion, a bustle pipe, pipes leading from the bustle pipe to the tuyeres, a casing surrounding the hood and flue, with an intermediate chamber, a pipe leading from the upper end of the chamber and connecting with the bustle pipe, and a heating chamber into which the products of combustion pass, the chamber surrounding a portion of the connecting pipe and communicating with an exit flue.
- 568,038. **APPARATUS FOR PRODUCING GAS.** Charles W. Pinkney, Smethwick, England. Assignor of one-half to the Tangyes, Limited, Birmingham, England. Patented in England, January 29th, 1895, No. 2,017. The combination of a vertical or practically vertical chamber for the carbonaceous matter, the chamber having between the upper part for receiving the fresh fuel and the lower part provided at its lower end with an outlet for the gases an intermediate part surrounded by a grate section, and means for introducing air and steam through the grate section.
- 568,069. **PACKING FOR OIL-WELL PUMPS.** William E. Karns, Parker's Landing, Pa. A single-piece packing-cylinder having a sleeve or core surrounded by alternate united layers of rubber and webbing adhering inseparably to the sleeve or core, the peripheral edges of the layers of webbing extending beyond the outer surfaces of the layers of rubber to provide for expansion.
- 568,074, 568,075. **COKE-OVEN.** Frank L. Slocum, Pittsburg, Pa. A longitudinally-extending coke oven having heating-flues in the side walls, and having the side walls between the coking chambers and flues formed of vertical slabs with horizontally and inwardly extending flanges above and below the flues, and horizontal tiles forming tile plates between the vertical slabs extending into the central wall beyond the slabs.
- 568,089. **ELECTROLYTIC APPARATUS FOR EXTRACTING GOLD AND SILVER FROM THEIR ORES.** Louis Pelaton, Paris, France, and Fabrizio Clerici, Milan, Italy. The apparatus comprises a vat, a mercury cathode upon the flat bottom thereof, an endless-belt anode, a portion of which is in parallelism with the bottom of the tank, and means for moving the endless-belt anode continuously in one direction.
- 568,229. **ELECTRODE.** Henry Blackman, New York, N. Y. An anode for use in electrolytic decomposition consists of a dense impermeable mass of combined electro-conductive iron oxide and a flux capable of acting to promote the fusion of the oxide.
- 568,230. **ELECTRODE FOR ELECTROLYTIC DECOMPOSITION.** Henry Blackman, New York, N. Y. An anode for use in electrolytic decomposition consists of electro-conductive ilmenite in a dense impermeable mass.
- 568,231. **ELECTROLYTIC ANODE AND APPARATUS.** Henry Blackman, New York, N. Y. An anode for use in electrolytic decomposition consisting of electro-conductive oxide of iron in a dense impermeable mass.
- 568,239. **COMPOSITION OF MATTER FOR ARTIFICIAL STONE.** Augustin Clerly, London, England. Patented in England, September 7th, 1893, No. 16,810. A composition consisting of a powder composed of pulverized freestone 50 parts, zinc oxide 20 parts, powdered glass 15 parts, powdered marble 10 parts, and calcined magnesia 5 parts, and a liquid composed of muriatic acid 40 parts, tin 30 parts and sal-ammoniac 30 parts.
- 568,289. **GRINDING MILL.** Emile Bailly, Nancy, France. Patented in France June 18th, 1895, No. 248,142. The combination of a pan provided with an annular series of discharge-openings, an annular trough located within the pan and surrounded by series of discharge openings, the balls located in the trough, a vertical rotary shaft having secured thereon a flanged and conoidal disk provided with recesses to receive the balls and with openings for passage of material from the top of the disk into the trough, and a tuyere surrounding the lower part of the vertical shaft for the admission of a blast to carry off the ground material through the discharge openings.

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 15TH, 1896.

- 16,738 of 1895. Mayer & Schmidt, Offenbach, Germany. Method of removing iron oxide from native emery.
- 21,575 of 1895. H. Martin, Paris, France. Alloys of aluminum and tugsten.
- 7,273 of 1896. D. A. Penckoff, Huy, Belgium. Producing double sulphides of aluminum and other metals.
- 8,558 of 1896. G. Fisher, Shotts, Scotland. Method of using dust from calcining furnaces for blast furnaces.
- 8,981 of 1896. S. Ganelin, Philadelphia, U. S. A. Producing oxy-chloro-carbonate of lead, as a substitute for white lead.

WEEK ENDING AUGUST 22D.

- 14,166 of 1895. A. C. J. Charlier, Glasgow. Method of using gaseous fuel in conjunction with hot air for ordinary galena to make white lead compounds.
- 15,144 of 1895. A. Shedlock, Jersey City, U. S. A. Concentrators for ores.
- 1,303 of 1896. W. Kirkham, Sheffield. Improvements in crucible melting furnaces for steel.
- 14,479 of 1896. A. F. Cothias, Paris, France. Alloys of copper, zinc, tin and lead.

WEEK ENDING AUGUST 29TH.

- 9,052 of 1895. J. C. Butterfield, London. Wet method of extracting gold and silver from antimonides, arsenides and sulphides.
- 15,024 of 1895. E. & G. Andreoli, London. Electrolytic method of producing amalgams to be used in making amalgamated copper plates.
- 17,063 of 1895. T. L. Willson, New York, U. S. A. Improvements in electric smelting.
- 17,901 of 1895. W. J. May, London. Ferro-sodium fluxes.
- 18,383 of 1895. J. & A. R. Lindley, Manchester. Preventing overwinding in collieries.
- 9,560 of 1896. A. H. Wetthey, Butte, Mont., U. S. A. Calcining and roasting furnace.

PERSONAL.

MR. RICHARD U. GOODE, of Washington, D. C., has gone to California.

MR. H. L. SIMMONS, of the Minah mine, Wickes, Mont., is about to leave on a business trip to London, Eng.

MR. J. K. TURNER, of Idaho Springs, Colo., has departed for the United States of Colombia to report on mining property. He will be absent three months.

MR. J. H. TIBBETTS, mining engineer, has returned to California from South Africa, after an absence of a year. He has been superintendent for an English syndicate.

MR. S. S. SMITH, an Alaska miner, arrived in Port Townsend recently with the result of five years' work in a hand satchel, some 30 lbs. of pure gold dust, worth about \$8,300.

MR. E. M. DU MARAIS, mining commissioner in the service of the government of France, accompanied by MR. E. P. ENDERS, of Paris, is in Butte, Mont., gathering information of interest to mining men.

MR. WILLIAM THOMPSON, mining engineer, ex-president of the Coolgardie Chamber of Mines, West Australia, has gone to British Columbia to make an examination of the gold-bearing districts of that province.

BARON DE BATZ, a Russian mining engineer, is en route home via San Francisco to St. Petersburg. This is not his first visit to this country, as some time ago he spent four years in Montana and is now employed by a Russian syndicate as an expert.

MR. EDMUND DETIENNE, of Liege, Belgium, who has been at Idaho Springs, Colo., for six weeks, reporting on the proposed United States tunnel, a project to be 3½ miles in length and cutting the Gilpin mineral belt, has left for home, taking, he claims, a favorable report on the tunnel as well as the district in general.

MR. WILLIAM FIELDING, an English capitalist, has been visiting the mining districts in Gilpin and Clear Creek counties and the Ouray District in San Miguel County. It is said that he has entered into a partnership with MR. CHARLES L. HOWELL to commence a mining tunnel and if it is brought to a conclusion some \$500,000 will be invested in San Miguel County.

MR. LOUIS JANIN, JR., mining engineer, and formerly on the staff of the *Engineering and Mining Journal*, is now in New York, after a protracted absence in Australia and England. Mr. Janin's stay here will be a short one, as he expects shortly to leave for San Francisco on his way back to Australia, where he expects to engage in mining operations in New South Wales.

MR. WALTER H. WILEY, of Idaho Springs, Colo., who examined certain of the Anaconda copper properties in Montana for the Rothschilds, will soon leave the United States for Korea, where he will examine lode and placer-mining property. The time allotted him for the investigation is limited to six months. The lands in question are included with certain concessions granted to the foreigners by the King of Korea.

MR. WILLIAM WESTON, mining engineer of Cripple Creek, Colo., has recently been elected a member of the Institute of Mining and Metallurgy, of London, and also of the American Institute of Mining Engineers. Mr. Weston is manager of the Goodwill Tunnel Company, of Cripple Creek, consulting engineer of the Gold Coin Mining Company, of Victor, and also of the White Hills Mining and Milling Company, of Arizona.

MR. F. M. DRAKE has been appointed general manager for the Campagne Francaise de Mines d'Or et d'Exploration, one of the largest French companies in South Africa. Mr. Drake erected the first water-jacket furnace ever built in Australia, which was put up at Herberton, in Northern Queensland, in 1883. His last appointment was as mining manager of the celebrated Wentworth Goldfield mines at Lucknow, and for 13 years he has been actively engaged in mining and metallurgical pursuits in the Australian colonies.

OBITUARY.

ANTHONY HORAN, mine superintendent for the Pennsylvania Coal Company at Dunmore, Pa., died on September 27th.

JAMES F. JOY died in Detroit, Mich., on September 24th, aged 86 years. While most of his interests were in railroads, he was also a holder of copper and gold mines in the Detroit District of Utah, and spent a large amount of money in developing them.

PROF. GEORGE H. MARKOE, one of the originators of the Massachusetts College of Pharmacy, was found dead September 25th in the laboratory of the Joseph Burnett Company's building in Boston. He was one of the best-known chemists in New England.

VAN N. OGLE died from heart disease at his office in Chicago on September 25th. Up to the time of his death he was manager of the Chicago agency of

the Island Coal Company, of Indianapolis, Ind., with which firm he had been connected several years. Some time ago he was in the employ of the Sunday Creek Coal Company, at Columbus, O.

JACOB BUSHONG, aged 72 years, died suddenly at Reading, Pa., on September 24th. He was associated in business with one of his brothers. The Bushong Brothers erected and operated the Keystone Furnaces, were owners of three large paper mills, owned several large farms, largely built the Berks County (now the Schuylkill & Lehigh) Railroad, were instrumental in the construction of the Wilmington & Northern Railroad, and were engaged in other enterprises.

SOCIETIES AND TECHNICAL SCHOOLS.

ENGINEERS' CLUB OF PHILADELPHIA.—At the meeting on September 19th Mr. Edwin F. Smith read a paper on "The Water Supply of Philadelphia, Considered with Reference to the Minimum Flow of the Schuylkill River," which was illustrated by blue prints and lantern slides. Discussion of the paper followed its reading. A business meeting of the club will be held October 3d, at which Mr. Richard L. Humphrey will offer a paper on "The Cement Laboratory of the City of Philadelphia, Its Equipment and Methods."

ENGINEERS' CLUB OF ST. LOUIS.—A meeting was held September 16th at No. 1,600 Lucas Place. The executive committee reported the establishment of a trust fund for the entertainment of visiting engineers, which, on motion, was ordered to be left in their hands, they to formulate a set of rules covering the matter, and submit them to the club for approval. The paper of W. J. Sherman on the Galveston Harbor Works was then read by Mr. B. L. Crosby, the author being absent. The paper gave a description of what is one of the most extensive improvements ever undertaken by the United States government.

ENGINEERS' CLUB OF CINCINNATI.—The regular meeting occurred September 17th at the new quarters of the Literary Club, No. 25 East Eighth street. Memoirs of Mr. A. E. Tripp, late engineer in charge of the sewer department, and Mr. George F. Nugent, assistant engineer in the engineering department of the city government, were presented and ordered spread on the records of the club. Neither was a member of the club, but both were held in high esteem.

Mr. H. F. J. Porter favored the club with a lecture on "Hollow Steel Forgings," which he illustrated by stereopticon. The lecture comprised a description of the manufacture of heavy steel forgings as practiced at the mammoth works of the Bethlehem Iron Company and of the establishment of the works of that company.

INDUSTRIAL NOTES.

The Birmingham (Ala.) Car Wheel Works are making arrangements to manufacture tramcar wheels.

The Colorado Fuel and Iron Company's steel plant, at Pueblo, is now in full operation in every department with a force of 2,000 men.

The Struthers (O.) Furnace, owned and operated by the Struthers Furnace Company, of Cleveland, has been blown in on Bessemer iron.

The Bethlehem (Pa.) Iron Company has shipped in the neighborhood of 50 tons of forgings for 13 and 8-in. guns to the United States Navy Yard at Washington.

The Buffalo (N. Y.) Drop Forging Company, incorporated in 1891, has gone into the hands of a receiver. The inventory of January 1st last showed assets of \$58,000; liabilities, \$19,000.

The Union Steel Company, at Alexandria, Ind., which recently went into the hands of a receiver, has started the sheet mill and 21-in. branch of its factory, giving employment to about 300 men.

The Eleanor Iron Works, at Hollidaysburg, and the Tyrone Iron Works, of Tyrone, Pa., resumed work September 29th after a long period of idleness. The two plants will give employment to 500 men.

The King, Gilbert & Warner steel mills, located at Columbus, O., have resumed operations after a shutdown since June 27th. Work will be continued until the recently received orders have been filled.

The Cleveland (O.) rolling mill has been closed down and 4,600 men are thrown out of employment. Only a sufficient force of men to keep the machinery in running order has been retained. President Chisholm said that the mills will probably be reopened after the election.

The Indiana Steel Casting Company, of Montpelier, Ind., has passed into the hands of receivers T. C. Neal, of Montpelier and Oscar L. Baker, of Cleveland. A mechanics' lien of \$13,500 held by a Cleveland firm that furnished the machinery for the plant caused the failure.

The New Jersey Metal Refining Company's works, located in Elizabeth, have been reopened. At present three furnaces are in operation and about 40 men are employed. The work is being pushed and

the officials expect to have the works in full swing with 150 men employed within a month.

The Buhl Steel Company, of Sharon, Pa., has decided to increase its capital for the erection of a steel mill from \$370,000 to \$600,000, and has asked the stockholders to double their subscriptions. The capacity of the plant is to be the same as was decided on some months since, to consist of six 30-ton open-hearth furnaces.

The Union Gas Engine Company, of San Francisco, Cal., reports shipment of a 25-H. P. hoisting plant to Daggett, Cal., for the Pacific Coast Borax Company, this being the fifth hoist manufactured for this company. Also a 19-H. P. hoist to the Eureka mine at Delamar, Idaho, and a 4-H. P. pumping plant to the Falbach Mercantile Company, at Tampa, Idaho.

At the Biddle mines, just east of Irwin, Pa., work has been begun on the erection of an experimental plant for the manufacture of fuel gas. The process to be employed is what is known as the Gardie process. If the experiments prove successful, cheap fuel gas for domestic and manufacturing purposes is promised. P. B. Malone and Lowrey Childs, of Pittsburg, are in charge of the experiment.

The Illinois Steel Company has suspended dividends upon its capital stock for the present, as a result of the falling off in business. The quarterly dividend for September was passed at the meeting of the directors, held in New York recently. The Illinois Steel Company has paid no dividends since 1893, except two quarterly dividends, one of which was declared in February and the other in June.

The New York Belting and Packing Company, Limited, has transferred the agency for its mechanical rubber goods in New Orleans, from the Whitney & Sloo Company, Limited, to the Chas. Munson Belting Company. These gentlemen are well known as being large manufacturers of leather belting in the West. They will have the exclusive sale of the New York Belting and Packing Company's goods for New Orleans and adjacent territory, and in addition to their own line will carry a full stock of rubber belting, hose, packing, etc., so that they will be in position to fill orders with promptness and exactness. The new store is located at No. 313 St. Charles street.

TRADE CATALOGUES.

The Deming Company, Salem, O., has sent us a copy of their 1896 catalogue and price list of iron and brass pumps for hand, windmill and power; hydraulic rams; artesian well brass cylinders; pump fixtures; well and tool supplies. The company is now in its seventeenth year as a manufacturer of pumps. The catalogue gives thorough details of all apparatus, is well illustrated, and contains other matters of interest that add to its value.

The Buffalo Forge Company, Buffalo, N. Y., has sent out copies of their illustrated sectional catalogue of the Buffalo horizontal and upright engines, comprising side-crank and self-contained horizontals with throttling governors, center-crank automatic cut-off horizontals, double and single automatic cut-off uprights, etc., for electric lighting and general refined service. The catalogue is a very neat one and is filled with good material.

MACHINERY AND SUPPLIES WANTED.

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

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

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

GENERAL MINING NEWS.

ARIZONA.

PINAL COUNTY.

SEARLES GROUP.—On this group, near Goldfield, work is being pushed on the main shaft with two shifts. The ledge continues uniform, but with a higher grade of ore. The prospect shaft being sunk on another part of the property is showing good results in the quantity and quality of ore exposed.

YAVAPAI COUNTY.

CONGRESS.—The shaft is now down 1,800 ft. in this mine, and 350 men are employed under ground. In addition to a cyanide plant with a capacity of 100 tons, there is a 40-stamp mill which runs night and day and 40 more stamps are to be added. About four miles of tunnels, shafts and stopes have been run. Besides the 1,800-ft. shaft, two others have been sunk to the depths of 700 and 1,100 ft. respectively. Crosscutting to the second vein has been commenced. The present output of the mine is said to be \$80,000 per month.

LITTLE ANNIE AND YUM YUM.—A carload of machinery and timbers has arrived for this mine and mill on Big Bug. The material is a part of the old 100-stamp mill of the Phoenix mine, near Phoenix.

The Yum Yum owners have purchased the machinery and timbers for a 10-stamp mill.

PROVIDENCE GOLD MINING COMPANY.—Three shifts of men are sinking the main shaft on this company's mine, now down 140 ft. and showing good ore. Drifts are being run by two shifts of men. The company has built a saw mill at the head of the Big Bug Creek. All machinery for the new mill is on the ground. The working force of this company comprises 50 men.

ARKANSAS.

BENTON COUNTY.

COSSATOT MINING AND REDUCTION COMPANY.—This company, of Siloam Springs, has been incorporated, with a capital of \$200,000, by R. S. Morris, William Tidball, H. N. Canfield, A. N. Van Hooser, H. N. Newbold, N. J. Sussman, William Looney, F. M. Axtel and Frank Moritz.

CALIFORNIA.

AMADOR COUNTY.

(From Our Special Correspondent.)

INTERNATIONAL GOLD SYNDICATE.—This syndicate, of London, is thoroughly developing the Richmond mine, which it holds under a working bond from State Mineralogist Crawford. The property is situated four miles from Plymouth. There is a 15-stamp mill on the premises. A cut 300 ft. long has been made at a depth of 80 ft. The syndicate has sunk thus far 136 ft. and has come on a large body of ore. The shaft is a double compartment one and is to be sunk to a depth of 700 or 800 ft.

RICHMOND.—This property, four miles from Plymouth, is being developed under a working bond by the International Gold Syndicate of London, England. A cut 300 ft. long is being made at a depth of 80 ft. The double compartment shaft now down 136 ft. will be sunk to a depth of 700 or 800 ft. At the 136-ft. level a large body of low-grade ore has been struck.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

CARSON CREEK.—This mine is on lower Carson Creek at its junction with the Stanislaus River. The ore carries 5% sulphurets, mostly iron and zinc. Forty stamps are at work and eight Woodbury concentrators are being added to the seven now in use.

EL DORADO COUNTY.

(From Our Special Correspondent.)

GRAND VICTORY.—The property of this company comprises 160 acres on Squaw Creek, seven miles southeast of Placerville. Fifty stamps are running day and night and 40 men are employed. The main shaft is down 280 ft. The ore is low grade.

FRESNO COUNTY.

(From Our Special Correspondent.)

POTTER RIDGE DISTRICT.—Mining is active in this district, on the south side of the Fresno River, near the terminus of the San Joaquin Valley road. The Gambetta, Mammoth, Buckskin, Starlight and Solano mines are in operation. The Lucky Bill mine, which has produced about \$50,000 in four years, has passed into the hands of the Syndicate and Safe Deposit Company. Development work has been commenced. The ore in this district is free milling; the ledge is over 12 ft. in width. Some of the shafts are down 500 ft.

MARIN COUNTY.

(From Our Special Correspondent.)

GOLDEN CROWN MINING COMPANY.—The Bolinas copper property, at Bolinas, is being developed by this company, which holds the land under U. S. patent. The croppings show some 4,000 ft. in length and 350 ft. in width. A shaft has been sunk 100 ft. and drifts run north and south 100 ft. on a 3-ft. vein. Assays show the ore to contain 12½% copper, 7 oz. silver and \$3 gold. A ton of selected ore has been shipped to the smelter.

MARIPOSA COUNTY.

(From Our Special Correspondent.)

It is reported that the No. 9 mine, 2½ miles east of Hornitos, worked to a depth of 400 ft., the quartz mountain, two miles south of Hornitos, down 200 ft. and the Washington mine, 2½ miles northeast of Hornitos down 1,500 ft., have been purchased by W. S. Chapman and others, who will reopen the properties at once. The last-named mine has been a large producer. The vein is from 6 ft. to 12 ft. in width.

MONO COUNTY.

Following are extracts from the latest weekly reports of the mine superintendents:

BODIE CONSOLIDATED MINING COMPANY.—200 ft. level.—Work during the week has been confined to the Gildea vein above the 200-ft level, enlarging the main Gildea raise and putting in 27 ft. of the waste chute. Are stopping fair-grade ore south from the top of this raise. Extracted during the week 19 tons (foreman's estimate) of ore from the Gildea vein on the 200-ft. level. Average assay value per ton, \$38.

BULWER CONSOLIDATED MINING COMPANY.—200-ft. level.—Extended the raise over crosscut No. 2 south 5 ft. and 8 in. of fair-grade ore in showing in the top. Are stopping as heretofore in this raise and are prospecting a small streak over the main drift, about 30 ft. south of the shaft. On the tunnel level have raised 5 ft. from east crosscut No. 2 on the vein that shows in No. 1 raise. The ore is low-grade. The raise above the intermediate drift was extended

4 ft., and the south drift from crosscut No. 3 was advanced 8 ft., connecting with the crosscut from the intermediate drift. During the week 69½ tons of Bulwer Consolidated ore was sent to the Standard mill, making a total of 226½ tons for this crushing. The yield of ore for the past week was as follows: 200-ft. level, 11 tons, assaying \$38.50; tunnel level, one ton, assaying \$25 to \$32. Total tons, 12; average assay value, \$38 per ton.

MONO MINING COMPANY.—On Bodie 400-ft. level the south drift on the Fortuna vein was extended 11 ft. during the week. Four inches of fair-grade ore is showing in the face of this drift.

STANDARD MILL STATEMENT.—Ore crushed during the week, 187 tons for the Standard Consolidated Mining Company, and 339 tons for the Bulwer Consolidated Mining Company. Average daily crushing, 364 tons. Average assay value vanner tailings, \$7.53 per ton. Concentrates produced, 1½ tons; assay value, \$55.91. Plate amalgam produced 561½ oz.

NEVADA COUNTY.

(From Our Special Correspondent.)

CADMUS.—At this mine, near Nevada City, the shaft is down 270 ft. At the 210-ft. level a 2-ft. vein was struck which shows up well in free gold and sulphurets.

GOLD HILL.—This property, consisting of two claims in Wood's Ravine, 1¼ miles west of Nevada City, is opened by both tunnel and shaft. The tunnel, which is over 5,000 ft. in length, is used for drainage only. The vein was followed the whole length through the adjoining properties. This mine has one of the finest mining plants in the State, the dynamos having a capacity of 5,000 volts.

SAN DIEGO COUNTY.

(From Our Special Correspondent.)

BOULDER CREEK DISTRICT.—Mat Wormer has located several claims running from the junction of Johnson and Boulder Creeks, about four miles below Cuyamaca Dam. Assays of ore from an 18-in. vein are reported to run from \$100 to \$370 per ton. Samples from a vein of tellurium ore on the property sent to the Selby Smelting Co. ran very high.

COLORADO.

CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

ATLANTIC-PACIFIC TUNNEL.—Attention has again been called to this tunnel, whose affairs were ventilated in full in the *ENGINEERING AND MINING JOURNAL* some years ago by Marie E. Hoyt, who has filed a complaint in the District Court at Denver, asking the foreclosure of a \$2,000,000 deed of trust, the appointment of a receiver and judgment for interest on such bonds. She sues in behalf of herself and other bondholders. A consolidation of this company with other proposed new companies was under way, and she alleges that it was for the purpose of freezing out the older interests. Much space is given in the complaint, which covers 81 pages of printed matter, to the sale of the property for taxes. After the sale had been made Mrs. Hoyt claims that the defendants to her suit, the Atlantic-Pacific Railway Tunnel Company, James E. Jones, trustee; William Frederick King, Daniel Adamson, Richard Pearse, acting British vice-consul; Willis M. Marshall, trustee; Benjamin F. George, Edward Reilly, A. S. Whitaker, the Atlantic-Pacific Tunnel Company and the Monte Cristo Mining and Milling Company, bought in the tax certificates; that they now hold these and will turn them over to the newly organized company under the consolidation. According to the *News* report, "the properties of the defendants include the Atlantic-Pacific tunnel and the Bonn, Great West, Senora, Warren, Alma, Comstock and Monte Cristo claims in the two counties mentioned. The plaintiff prays judgment for \$16,010 for semi-annual interest due her as holder of bonds; that all the holders of bonds and coupons of series A, B and C have judgments against the company for the several amounts of semi-annual interests due them, that an accounting be made and that the defendants be restrained from selling or in any way disposing of A, B and C series bonds not yet issued; that the deed of trust be foreclosed and the properties sold; that a deed of conveyance be made on certain claims to secure the payment of bonds of series A, B and C; that the Monte Cristo Mining and Milling Company and the Atlantic-Pacific Tunnel Company be required to give a deed of conveyance of the Monte Cristo properties; that the defendants be enjoined from disposing of tax certificates of sale now in their possession. The trust deed in question was made to secure the issue of first mortgage bonds due 20 years from March 1st, 1887." While the name of the widow of the late M. M. Pomeroy does not appear, it is claimed that she is favorable to the reorganization.

DICTATOR.—This mine, near Lawson, was recently started up again by Samuel Market. In drifting and sinking, a pocket of silver ore was encountered, and a shipment made through one of the Idaho Springs ore-buying establishments returned 720 oz. silver per ton.

DORIC GOLD MINES COMPANY, LIMITED.—This English company is operating the tunnel and group of claims at Georgetown. Air drills are in use in extending the tunnel and rapid progress is being made toward Saxon and Griffith Mountains. The company has just purchased the Mascot and West Summit mines for \$32,000 and added them to the group.

LAMARTINE.—The management has resumed drifting on the big drainage tunnel which was com-

pleted to the 1,000-ft. shaft early in the year. It will now be used in crosscutting to a number of claims lying on Hanchett hill to the west. It has already been extended 600 ft. west of the shaft. In extending some of the older levels in the mine new bodies of ore have recently been encountered.

NEWHOUSE TUNNEL.—It is currently reported that the management of this project is arranging to begin the mining of ores already cut, at an early date. It is now driven into the mountain over 6,000 ft. and some of the Seaton Mountain veins have probably been cut. It is impossible at this time to secure information from the management as to the strikes of ore, or as to future plans.

NEWTON.—At this Idaho Springs mill an electromagnetic process is being introduced for the saving of what values may be lost after the batteries, jigs and bumpers have had their trial. At this writing the treatment is not far enough advanced to report success.

ROSCOE PLACER.—The company which had been organized for working over ten miles of the ground along Clear Creek has decided upon some necessary changes in the system of work before they will be able to make the placer mine a success. A pipe line was constructed a distance of almost two miles for the purpose of furnishing hydraulic power. After an experiment lasting more than six months, it has not proven a success, and all work has been stopped pending the future action of the company. It is understood a recommendation has been made for the construction of a flume to bring the water down to the point above the works, and then give it a fall through pipes to the creek bed. In this way it is believed sufficient power can be secured to successfully wash the gravel and handle it. About \$50,000 will be needed for the new work.

TENTH LEGION.—In extending the lower level of this Empire camp property, the vein is shown to carry 20 in. of solid ore, a carload shipment of which returned 535 oz. gold to the ton. Development work will be continued for the purpose of blocking out a greater reserve.

EL PASO COUNTY—CRIPPLE CREEK DISTRICT.

BEN HUR MINING AND MILLING COMPANY.—The secretary of this company, which owns the Ben Ton, Little King, Queen, Minnie H., Mossback, Tejon and Optimus claims, has issued a circular letter to the stockholders from which we take the following: At the time the new board was elected the treasury was exhausted and the company largely involved in debt. The stock was quoted on the market at less than one cent a share. An issue of 100,000 shares of new stock was authorized at a stockholders' meeting and netted the company \$4,500. Cash in the treasury at this time is \$1,500. A meeting of stockholders is called for October 20th, at Colorado Springs.

(From Our Special Correspondent.)

BEACON HILL.—This is now the Mecca for prospectors and the recent discoveries make all ground valuable. The Babbit lease, on the Prince Albert, ships nearly 10 tons a day of a fairly good grade. The ore is broken right at surface; in fact, the surface dirt samples \$40. St. Peter, Aztec and other claims, adjoining the Prince Albert, Gold Dollar, etc., are being eagerly sought after by lessees.

CRATER.—This property, on Globe Hill, has shipped 300 tons of smelting ore, all of which was taken above the 20-ft. level during the month. This does not refer to the ore which the five lessees are shipping from their surface leases, but refers to what the company shipped.

ELKTON.—This mine now gives employment to 86 men. The 3d level has been driven in the Walter ground 295 ft. and the vein now yields 2 ft. of good ore. The 2d level has been driven in the Walter ground 330 ft., and also yields ore. Both drifts are wet. This month the mine has yielded more ore than any previous month. The mine pumps 575 gals. per minute.

HILLSIDE.—This mine, on Gold Hill, is being worked under lease by Messrs. Kinney & Haman, who have sunk a new shaft 85 ft., from which more than sufficient ore was taken to pay all expenses. A second level has been started at 85 ft., and stopping will shortly be done.

LITTLE MAY.—This property, on Beacon Hill, under lease and bond to Judge Buris, of Cripple Creek, is, from appearances, likely to be a good mine. At the session of the Institute of Mining Engineers held in this town, two specimens were shown from this mine which have had no superiors as telluride specimens for beauty and value in the camp; they were veritable "eye-openers." These specimens were taken from a winze in the bottom of the tunnel 40 ft. deep, the total depth from surface 100 ft. deep. A steam hoist has recently been erected and development will now be actively pushed by the lessee.

MOOSE.—At this mine, on Raven Hill, work has commenced at sinking below the 650-ft. level. The shaft is dry at present, but a pump, No. 7 Cameron, is on the ground in case water should be met. The bottom of the shaft assays well.

MUNGER.—This lease, on the Orphan Belle property, has been sold to Mr. Head, of Cripple Creek. Mr. Munger has considerable reserves blocked out. Mr. Head's intention is to so arrange the machinery as to increase the output two-fold. Mr. Head has devoted his entire time to leasing in this district for nearly two years and without success; but this lease will doubtless reward him, as he deserves.

PORTLAND.—The rate of sinking at this mine is rather slow. Last month only some 30 ft. was sunk, and this month some 25 ft., the water being a drawback of a serious nature. The shaft is now 680 ft. deep. When 800 ft. is reached a level north will be extended under the Anna Lee. The present output is nearly 80 tons a day.

GUNNISON COUNTY.

COLORADO FUEL AND IRON COMPANY.—Roger C. Evans, who claims to own 80 acres of coal land in the Gunnison District, has sued this company for \$1,408,700 damages for coal alleged to have been mined on his land and converted to the uses of the company. Evans secured a verdict for \$35,400 in the Gunnison County District Court and the defendants have now carried the case to the Court of Appeals. In his complaint Evans recited the fact that on October 2d, 1880, he made a coal declaratory statement before the United States land officials at Gunnison for the east half of the northwest quarter of section 10, township 14 north, range 86 west, alleged to be valuable coal land. A few days later the entry was suspended by the commissioner of the general land office, on account of a belief that part of it was in the Ute Indian Reservation. During the suspension and while Evans still held his rights under his statement, it was alleged one Byron McMasters made a private cash entry on the land and later made a warranty deed for it to other parties for the benefit of the Durango Land and Coal Company. Evans contested McMasters' claim and the case was fought through the local land office, the commissioner's office and up to the secretary of the interior, Evans getting the decision each time. Finally, on February 28th, 1895, after years of fighting, he secured a government patent to the land. In the meantime, however, it was charged that the defendants had entered into possession of the land and had mined coal from it during all the time that the case was being fought in the land courts. It is charged that 1,045,000 tons of coal were mined and sold for the benefit of the defendants, the Colorado Fuel and Iron Company being the successors of the Durango Company. Evans finally brought the suit to recover.

MINERAL COUNTY.

HOLY MOSES TUNNEL.—It is reported that Senator Abbott has struck a 6-ft. vein in this tunnel after driving within 25 ft. of the distance of 1,100 ft., which the survey at the outset indicated would have to be driven.

OURAY COUNTY.

(From Our Special Correspondent.)

AMERICAN NETTIE.—Manager Wrisberg arrived lately from St. Louis, and ordered the force increased to 40 men. Regular shipments of gold ore are being made.

BACHELOR.—The upper workings of this property are almost divested of high-grade ore, and operations have been transferred to the lower tunnel, where a body of unexplored ground yet remains. About 50 men are employed. The upper dump is being hauled to a neighboring mill by the Bachelor Company.

BACHELOR No. 2.—A quarter interest in this property was disposed of recently to a member of the Bachelor and Khedive Company, and a force of men is now engaged in sinking for the vein several hundred feet west of where it was first disclosed. Some rich ore has been encountered in the shaft, which is now 50 ft. deep. The vein, at its discovery, is 14 in. in width, and is a true fissure lying in red shale. The property is now owned by Murphey Sons & Company, and has attracted considerable attention by its recent disclosures of ore.

CALLOPE.—A 10-stamp mill is being erected for treatment of the low-grade ore in this property. It will be in operation by November 1st.

COPPER QUEEN.—This property, on Bear Creek, has struck rich ore and has 300 sacks ready for shipment, with more in sight.

GENESSEE & VANDERBILT.—These properties have suspended indefinitely owing to scarcity of demand for the class of ore they produce.

GRIZZLY BEAR.—The vein has diminished in size, necessitating a decrease in the working force, only a small percentage of which has been retained. Small shipments continue.

KHEDIVE TUNNEL.—Improvements are being pushed on the surface at this point to procure means for handling the output before winter sets in. An ore house, 100 ft. x 50 ft., is being erected for the separation of different grades of ore more expeditiously than any similar equipment heretofore constructed in Ouray County. The building is of two stories. Connecting the ore house with the mine will be a high trestle 380 ft. in length, upon which work will begin as soon as lumber can be secured. Boarding and bunk houses are also to be erected. The Khedive tunnel has cut the Bachelor vein 300 ft. below the Bachelor workings and has 3 ft. of high-grade ore, together with much upward stopping ground and an indefinite extension downward of the ore body.

LITTLE MAUD.—Lessees have taken this mine after some years of idleness and will endeavor to again bring the property into the list of producers.

NEOSHA.—Cripple Creek capitalists have secured a lease and bond on this group, and a force of five men has been engaged in breaking ore, running well in gold, silver and lead. One hundred sacks were shipped this week to the American Zinc-Lead

Works at Canon City for test. The vein is 4 ft. wide, and is solid ore between walls.

NEW BRITAIN.—Forceman Brothers and others are pushing operations, and have their ore house filled with a medium grade of lead ore, shipments of which will begin as soon as a road to the property, now undergoing construction, is completed.

NORTH STAR.—A new Mexican syndicate has leased this property and a force of men is at work. Harry Comenode is in charge.

O. & N. TUNNEL.—Since opening the pocket partially developed some years ago by the American Nettie, the O. & N. has shipped one carload of ore which netted \$2,000. Another carload will be shipped this week.

RUBY TRUST.—Five men have been installed at this property and steady shipments are the result.

SLIDE.—The upper workings, containing 750 ft. of ground, have been leased to Johnson & Swaine and good ore in small quantities is being taken out.

VIRGINIUS MINING COMPANY.—It is impossible to ascertain the correct figures for the output from this property, but those who claim to know give an estimate of \$300,000 per month. Improvements are being made, and not an idle mule train or ore team is in the city.

WEDGE.—After a considerable outlay of capital and months of dead work, this tunnel has broken into a spur of the Bachelor vein, and is now shipping high-grade ore. By connecting with the Bachelor workings, the Wedge, which formerly experienced trouble with poor air underground, is now enabled to proceed with a full force of men.

SAN MIGUEL COUNTY.

NELLIE GROUP.—It is reported that this property, owned by L. L. Davis, of Telluride, has been sold to Denver parties for \$75,000 cash. The group consists of two patented claims and a patch of 35 acres of placer ground. The properties are located about one mile from Bear Creek Mill, at which place the ore will be treated. The proposition is a free-milling one, and has already produced over \$100,000. It is said to be regarded by mining experts as one of the best properties in the district. It is estimated that there are 50,000 tons of ore in sight, or virtually blocked out. What development work has been done consists of 2,200 ft. of levels and 22 ft. of upraises, all in ore. A force of men will be put to work without delay.

GEORGIA.

POLK COUNTY.

GEORGIA SLATE COMPANY.—This company has leased the slate property owned by J. T. Garner, of Greenway, for a term of 30 years and will develop it extensively in the near future. The slate in the new quarry is said to be a very fine quality.

IDAHO.

BOISE COUNTY.

JUPITER.—A 400-ft. tunnel has just tapped the vein in this mine on Summit Flat at a depth of over 100 ft. The tunnel has gone 20 ft. into the vein without finding the opposite wall. The mine is in the vicinity of the Mammoth.

ELMORE COUNTY.

ELMORE.—This mine, at Rocky Bar, has been closed down because there is no more ore in sight.

OWYHEE COUNTY.

BLACK JACK.—This mine and mill is running a full force, the latter being taxed to its utmost. About 1,000 tons of ore are crushed monthly. The payroll shows about 112 men employed.

SHOSHONE COUNTY.

STANDARD MINING COMPANY.—The ore body was struck recently in the Campbell tunnel of the Standard mine. This tunnel is 2,640 ft. and is 530 ft. below the Banner tunnel. The ore body is 7 ft. wide at the point where it was encountered in the tunnel at the end of the chute. The workings will be continued each side of the tunnel with three shifts of eight hours each. The ore is of the same grade as that in the upper workings. The tunnel will be equipped with a double track and a compressed-air locomotive will haul out the trains of loaded cars to the bins at the mouth of the tunnel. The bins, which have been recently completed, have a capacity of 1,000 tons. From the bins the ore will be loaded on railroad dump cars and hauled to the mill at Wallace, a distance of seven miles.

KANSAS.

ALLEN COUNTY.

PALMER OIL COMPANY.—This company struck oil recently in a well four miles west of Iola and it is estimated that the yield will not be less than 20 bbls. a day.

MAINE.

OXFORD COUNTY.

CANTON MICA MINING COMPANY.—This company has been organized for the purpose of carrying on mining of all kinds in the town of Canton and vicinity, with \$10,000 capital stock, of which \$40 is paid in. The officers are: President, Thomas Reynolds, of Canton; secretary, Elliott W. Howe, of Canton.

PISCATAQUIS COUNTY.

FOXROCK.—The vein of gold quartz on George Lebroke's farm, in Foxcroft, has been assayed and is said to show a good per cent. of gold. A company is now being formed to make excavations and test the ore at a greater depth. The vein is several feet

wide and lies between a ledge of limestone on one side and sandstone on the other.

MICHIGAN.

COPPER.

CENTENNIAL COPPER MINING COMPANY.—Mr. Harry F. Fay, president of this company, makes the following report of his investigations of the property: It comprises 640 acres of mineral land in Houghton County, and the three Master lodes (Calumet Conglomerate, Osceola Amygdaloid and Kearsarge Amygdaloid) underlie it. To the south and adjoining is the Calumet & Hecla mine, and the Calumet Conglomerate lode, which outcrops on our surface, crosses the entire length of our property, dipping at an angle of about 38°. To the west lie the Tamarack and Tamarack, Jr. mines, working the conglomerate. To the north and east lie the Kearsarge and Wolverine mines, each working the Kearsarge Amygdaloid lode. Between the Calumet Conglomerate and the Kearsarge Amygdaloid veins the Osceola Amygdaloid outcrops on our property and has already been successfully worked by us, although not explored to any great depth. Surface improvements are two office buildings; oil and powder houses; carpenter, machine and blacksmith shops; barn, engine, rock compressor and tool-houses and a fully equipped stamp mill. Also 40 frame and log dwelling houses (all occupied) and a school-house. All of this has been kept in perfect order and condition. The property (buildings, machinery and supplies) above ground is inventoried at \$120,000. The Calumet Conglomerate outcrops on our property for about a mile. It has been proved that toward the south the rock was not of much value, but toward the north it grows richer and richer. In No. 3 shaft it was not valuable; in No. 4 (farther north) some excellent copper was found and also a very good chute of copper dipping toward No. 6. In No. 6 (still farther north) some rock of very high grade was met, and again another chute which, starting at 40 ft. in length at the surface, has increased to 100 ft. at the fourth level, and was 10 ft. to 14 ft. wide. This ground is very rich. The fifth level had been extended to a point about 50 ft. from the line of the chute of copper which is dipping rapidly toward shaft No. 7. Shaft No. 4, which is south of No. 6, is down 1,100 ft. from the surface, and at the ninth, tenth and eleventh levels the load is from 10 ft. to 15 ft. wide, with a streak of copper about 15 in. wide running through it and gradually getting wider as it extends north.

Three propositions are submitted to the stockholders: (1) To unwater No. 6 shaft; extend the fifth level say 50 ft. into the coppery ground; drive through it to discover its dimensions; sink a winze on the foot-wall down, say, 100 ft.; then drive north and south at that depth, and if copper is found as on the levels above, it will be an established mine on the great Calumet Conglomerate. (2) Unwater Nos. 1 and 2 shafts on the Osceola Amygdaloid, and I am confident we can establish a mine on that lode. Captains Parnall, Hall and Hosking, besides Captain Daniel and Captain Chynoweth, are of the opinion that the Osceola, on this property, shows up as well or better than it ever did at the Osceola mine at the same depths. (3) Sink a vertical shaft down, say, 400 ft., to intersect the Kearsarge Amygdaloid vein, and then carry it down on the lode, thus making a mine on the Kearsarge Amygdaloid. Directors Harry F. Fay, Thomas H. Perkins, William Basset, John C. Watson and James R. Dee have considered this report, and are unanimously of the opinion that when work is resumed it should be at shafts No. 6 and No. 7, as suggested in proposition No. 1.

ONTONAGON COUNTY.

HOLLOWELL MINING COMPANY.—This company, of Cleveland, O., will open 2,500-ft. shafts six miles west of Ontonagon. Pumps, hoisting, drilling, cars, engines and excavators will be installed at once.

MINNESOTA.

(From Our Special Correspondent.)

Two more of the Bessemer Steamship Company's vessels have been launched, but they will probably not be put in commission till next year, on account of the poor outlook for freights. There are more ships of this fleet now afloat than will be needed to carry its ore for the remainder of this season.

Ore shipments from Two Harbors last week were only about 30,000 tons, and all the ships of the Minnesota Iron Company are withdrawn from the trade and put into grain. Only vessels under contract are now at work in the ore trade there.

D. H. Bacon, President of the Minnesota Iron Company, has gone East and the fact has been made the basis for a hope that the company was to re-sume very soon. The hope is probably without much foundation, though there are rumors that the mines will start up in some way before long.

MESABIC RANGE.

(From Our Special Correspondent.)

ADAMS IRON COMPANY.—This property has dismissed all but its married employees and is doing but little. About 80 men are still employed in the stripping by a contractor.

ARCTURUS MINING COMPANY.—This new company, located at the west end of the Mesabi, in sections 13 and 24, town 55-24, being the most westerly property of all the range, now has two shafts down; one 60 and the other 90 ft., and has sunk a drill through 145 ft. of ore to the bottom of the deposit. The ore is an excellent Bessemer. The property is a large one and will be connected with the lake by a branch of the Duluth, Superior & Western road to be built when the company is ready to guarantee

freights. The discovery will give an impetus to mining on the western end of the range.

CLOQUET IRON COMPANY.—This company is sinking another shaft about 500 ft. east of the former hoisting works, and is putting in a new engine-house. Its stockpile, the property of the former company, the Vega, is being shipped as fast as possible.

COMMODORE MINING COMPANY.—This company has commenced the erection of a new shaft-house, and is preparing for active work as soon as the conditions warrant.

FRANKLIN MINING COMPANY.—This company, which had suspended shipments for some little time, has resumed, and is sending out about 85 cars a day to Duluth.

OLIVER MINING COMPANY.—This company has now shipped about 775,000 tons, and is finishing its season's business at the rate of about 5,000 tons a day. About five-eighths of the ore shipped from the mine is a Bessemer, and it has been gotten out at small cost. Two shovels have been working in ore all season, with about 125 men, and they have averaged since shipping began about 5,000 tons a day. Much time has been lost in waiting for cars and in small breakdowns, and at times the shovels have loaded as high as 5,000 tons each in 10 hours. Little work will be done at the mine after it closes down about October 5th.

MISSOURI.

JASPER COUNTY.

VICTOR MINING COMPANY.—This company's plant was last Friday taken charge of by Sheriff Crane on attachments issued in Circuit Court amounting to about \$4,000. The plant was shut down as soon as the sheriff took possession. This is the second time the sheriff has levied upon the property for creditors, the company settling claims satisfactorily before. The Victor Company is composed of Ohio capitalists and has valuable property. About six months ago the old steam jig plant was destroyed by fire, but orders were at once given for the erection of a new one, which was recently completed at the cost of \$10,000. On this the Bank of Carterville holds a prior mortgage for \$5,000. It is said that for several weeks past the plant had been running on supplies furnished by the various dealers, and they looked for a settlement of claims upon the visit of the officials of the company, who were here the first of the week. It appears, however, that orders were left to continue operation and sinking of a shaft to go after deeper ore, but no provisions were made for settlement with creditors, hence the attachments. The Victor is one of the best producers in the district and will not be idle long. The stockholders of the company are amply able to pay off the indebtedness, and it is believed that they will do so.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—The output of ore last week was a little less than the week before, although the sales were about the same. This leaves less ore on hand than there has been in the camp for some time. This, together with the shipment of ore and spelter to Europe, will make a greater demand for ore and a better price. The top price paid for zinc ore last week was \$20.50 per ton, with an average of \$19 per ton. The price paid for lead ore was \$14 per 1,000 lbs., with 50c. added for hauling. The following was turned in from the different camps: Joplin zinc, 1,332,000 lbs.; lead, 189,920 lbs.; value, \$16,740; Webb City zinc, 489,680 lbs.; lead, 36,850 lbs.; value, \$4,943. Carterville zinc, 947,530 lbs.; lead, 183,470 lbs.; value, \$11,487. Galena, Kan., zinc, 2,600,000 lbs.; lead, 465,000 lbs.; value, \$26,730. Aurora zinc, 490,000 lbs.; lead, 61,000 lbs.; value, \$4,709. Alba zinc, 146,000 lbs.; value, \$1,490. Mt. Vernon zinc, 81,540 lbs.; value, \$815. Oronogo zinc, 58,870 lbs.; lead, 13,460 lbs.; value, \$579. Sherwood zinc, 18,830 lbs.; value, \$178; Zincite zinc, 15,610 lbs.; value, \$140. Totals for district: Zinc, 6,240,120 lbs.; lead, 950,300 lbs.; value, \$67,781.

BUNKER COMPANY.—At the Bird's Nest shaft they are hoisting rich jack dirt and last week obtained and sold over 60 tons of high-grade zinc ore. They are drifting at 135 ft. on a 20 ft. face of zinc ore in hard ground, with enough water to wash the dirt.

COWAN, KINMOUTH & COMPANY.—A lease has been secured on a large tract of land near Jackson Station. They have drilled three prospect holes and have good bodies of ore in all of them from 80 to 180 ft. deep. Henry Jones, of Galena, Kan., has secured a lease on four lots near one of the drill holes and has commenced to sink a shaft to the ore. Other parties are taking lots on this lease and will sink shafts.

GLOVER, MELOY & COMPANY.—They have leased four lots on the Ferguson land near the State line. They have a shaft down 58 ft. and have gone through 10 ft. of good pay lead dirt and are now sinking in a good body of zinc ore.

JAMES & COMPANY.—Two lift pumps are being put in one of the old shafts on the McCoy land, in Possum Hollow, and will drain the ground. There have been some good mines on this land and there is plenty of ore in the ground yet, but the water must be pumped off so that the ground can be worked.

KING, LANWORTHY & COMPANY.—The Fayetteville mine, on the Harrison lease, is operated by C. Lanworthy, Dan King, Lem Short and Clark Snye. They are drifting on a body of lead and jack in open ground at 70 ft. and they also have a run of ore at 100 ft. that has been under water for some time.

Last week they turned in 10,000 lbs. lead and several tons of zinc ore.

WALDREN MINING COMPANY.—This company, which has leased 80 acres of Arneil land west of Joplin, has a shaft down 130 ft. and is drifting at that level on a good run of zinc ore in shooting ground. This week they will commence to wash the dirt, which is improving every day and they will soon have a good paying mine.

MONTANA.

GRANITE COUNTY.

MORNING STAR GOLD MINING COMPANY.—At a meeting of this company, held in Phillipsburg recently, the following officers were elected: U. F. Hughes, president; C. P. Luse, vice-president, and James Biggs, secretary. The quartz properties of the company are situated on the middle prong of Gold Creek. There are four full claims in all, upon which they have several distinct leads, one of which is about 2 ft. wide.

JEFFERSON COUNTY.

BUTTE MINING AND MILLING COMPANY.—This company has filed a suit against W. R. Kenyon, H. L. Frank, William McDermott, Wm. M. Tuohy, Geo. H. Tong, Patrick Clark and Theodore Sweitzer to recover \$17,770, the alleged value of the Kittie O'Brien stamp mill, which was destroyed by fire September 28th, 1894. The complaint states that the mill was under lease to the defendants, and that by reason of a defective firebox in the furnace and the placing of a damper in the smokestack at the instigation of the defendants the mill caught fire and was destroyed. The complaint further alleges that when the mill was turned over to the defendants the furnace was in good condition and that the lessees permitted the same to get out of repair to such an extent that by the closing of the damper fire was forced through the combustion chamber into the woodwork of the mill with the result that the mill was incinerated. Defendants, says the complaint, leased the mill from plaintiffs May 8th, 1894, and entered into an agreement stipulating that the mill was to be kept in good repair and returned to plaintiffs at the expiration of the lease; all of which was not done.

FREE COINAGE.—Everything affected by the strike at this mine has been adjusted between the union and the owners, and the mine is now working as usual, taking out some ore from the 300-ft. level. Between the fourth and fifth levels no ore has been raised, and considerable dead work will have to be done before the levels will be in shape to stope.

NEVADA.

HUMBOLDT COUNTY.

GOLDEN EAGLE MINING COMPANY.—This company proposes to erect a concentrator on its property this season. The mine shows a good body of ore.

STOREY COUNTY—BRUNSWICK LODGE.

The following are extracts from the latest weekly reports of the mine superintendents:

OCCIDENTAL CONSOLIDATED.—The latest official letter from the superintendent says: 750 level.—The winze started in the north drift is down 125 ft., advanced during the week 16 ft.; bottom in quartz and porphyry, showing very little value. From the 650 and 550 levels we have extracted and milled during the week 162 tons of ore, of the average assay value, as per battery samples \$9.75 per ton actual value.

STOREY COUNTY—COMSTOCK LODGE.

CONSOLIDATED CALIFORNIA & VIRGINIA.—1,750 level.—From the 12th to the 24th floors above the sill floor of this level, at the north end of the stope, in old ground of former workings, we have extracted during the week 153 tons of ore, the average assay value of which—per sample taken from the cars in the mine—was \$43 per ton. From the 16th floor, from the upraise which connects with the 24th floor, from the end of the west drift, we are stoping on the 17th floor in old ground assaying from \$20 to \$30 per ton. On the eighth floor we are drifting north in old ground assaying \$6 per ton, to reach a point under the thirteenth floor, from where we have fillings assaying \$30 per ton. The total extraction of ore for the week amounted to 153 tons, the average assay value of which, per samples taken from the cars when raised to the surface, was \$41 per ton.

HALE & NORCROSS.—In the 900-ft. level, the north drift at a distance of 246 ft. has been stopped and an east crosscut has been started 239 ft. in, and advanced 12 ft. in clay and porphyry. In No. 1 upraise the ore struck continues to improve as they raise. On the 1,100-ft. level have stopped work in the north drift, which is in 174 ft., and started an east crosscut therefrom at a point 50 ft. in. When this crosscut was in 4 ft. a streak of quartz assaying \$21 gold, coin value, was cut. This is the same streak from which a car load of ore was taken during the previous week. The crosscut is now in 12 ft.; face in porphyry. Extracted during the week 15 car loads of ore, assaying per mine car sample \$35 in gold and 60 oz. of silver per ton.

OPHIR.—In the old Central tunnel workings of this mine, from the end of the north drift from the west crosscut from the Mexican shaft at a point 132 ft. from its mouth we have worked upward 14 ft. in old ground of former workings assaying from \$2 to \$4 per ton.

POTOSI.—In this mine the west cross-cut from the north drift run from the top of the raise above the 450-ft. level is now out 150 ft. The face is in por-

phyry, clay and quartz of no value. The raise from this north drift to connect with the tunnel level has been extended 18 ft. for the week and is up 23 ft. The top is in quartz assaying \$5 to \$10 per ton.

NEW MEXICO.

GRANT COUNTY.

GOLDEN GIANT MINING COMPANY.—This company has about 50 men employed in the mine and mill. The ore in this vein appears to increase both in quantity and quality as depth is attained. Lee F. Cowan, secretary and treasurer of the company, also acts as general business manager.

LOTTA.—C. Sharp and George Snyder are working this mine. They have an adit level on the vein 270 ft. in length, showing a fair body of ore along the vein. A winze from this level is down 70 ft. and shows a body of ore 16 in. wide which assays well in gold.

MINA GRANDE.—Bell & Stevens are developing this mine. The south shaft is down 58 ft., and a drift has been run 170 ft. in the direction of the north shaft; the drift will be about 600 ft. in length to strike the north shaft which it will intersect at a depth of 197 ft. The north shaft is now down 125 ft., and will be continued to point of intersection with the level mentioned above.

NANCY LEE.—Kline & Keister are working this mine on the 120-ft. level from the incline shaft. They have a body of good pay gold ore 2½ ft. in width.

NEW YORK.

ESSEX COUNTY.

PORT HENRY IRON ORE COMPANY.—The announcement is made by this company that their mine will shut down indefinitely this week. The reason given is "the want of room in which to store the ore," as no sales are being made.

NORTH CAROLINA.

CABARRUS COUNTY.

NATIONAL ORE AND REDUCTION COMPANY.—It is reported that this company, of St. Louis, Mo., will work some properties in the county. Col. Geo. Ed. Symms, their agent for the South, has been spending some time in the field.

WATTS MINE.—This property is being developed by Dr. Woods, Senator Betts and others of Colorado. They have erected a 5-stamp mill and are preparing to sink several hundred feet on a quartz deposit.

GRANVILLE COUNTY.

(From Our Special Correspondent.)

OXFORD GOLD MINES.—Interest is centered on some gold bearing quartz deposits near Oxford. They were discovered about the first of the year, and in the small amount of development has produced rich gold-bearing quartz. Col. E. B. C. Hambley, mining engineer from London, England, is developing one of the properties by two 50-ft. shafts. Capt. George Horn, an Australian, is erecting a 5-stamp mill and expects to begin crushing in 10 days. Much of the quartz shows free gold on the surface, while below the decomposed zone sulphurets of good value are encountered. The district is a new one for gold, having never been worked otherwise than as farms.

RANDOLPH COUNTY.

KEYSTONE MINING AND MANUFACTURING COMPANY.—This company, of Butler, Pa., has been organized to operate the Jones mine (now Keystone). They have erected a 40-stamp mill, and hope soon to have it in operation. The officers are as follows: Amos Steelsmith, president; H. D. Gamble, vice-president; E. E. Abrams, secretary and treasurer; W. J. McKee, superintendent.

ROWAN COUNTY.

GOLD HILL.—The 10-stamp mill is in operation here about 3 days every week on tribute ore from the mines.

REIMER.—This mine is about to be put into operation by Col. Fred H. Stitts and associates, of Washington, D. C.

STANLY COUNTY.

CULP.—This mine is being worked by Geo. W. Propper, Dr. Wood and ex-Senator Betts, of Colorado. These gentlemen at present are all here watching operations and the starting of the Elspass frictional roller quartz mill. The inventor, Mr. J. H. Elspass, is here erecting the mill. He is from Denver, Colo. They have on the dump at this mine about 40 tons of ore, and as the capacity of the newly erected mill is two tons per hour, it will soon be out of ore unless the mine is capable of producing a sufficient quantity.

NEW LONDON ESTATES COMPANY, LIMITED.—The Parker Gold Mines, owned by this company of London, Eng., have gone into liquidation.

OHIO.

BELMONT COUNTY.

PAXTON.—An incendiary entered this mine, in the suburbs of Martin's Ferry, last week, and set fire to the mine. The fire spread to the coal, and when it was discovered a large area of the mine was in a blaze. The fire department was called, and the flames were only subdued after hours of hard work and the flooding of the mine.

WASHINGTON COUNTY.

MARIETTA OIL COMPANY.—This company struck oil last week in their wildcatter field on the Taylor

farm, at Coal Run. It is in the Berea sand and opens an entirely new field.

PENNSYLVANIA.

ANTHRACITE COAL.

EBERVALE WASHERY COMPANY.—This company has purchased the Audenried culm banks, near Hazleton, and will build a washery there, the plans indicating it will be the largest of the kind in the region. These banks are among the largest in the anthracite coalfields and are said to contain immense deposits of marketable coal.

GREENAUGH LYKENS VALLEY COAL COMPANY.—This company has begun work on the new breaker near Shamokin. The colliery will have a capacity of 300 cars per day and will employ 500 men and boys.

SOUTH DAKOTA.

CLARK COUNTY.

FAUST GROUP.—The main shaft of this group is now down 145 ft., and has passed through strata of porphyry and shale. The last 7 ft. is in a red quartzite shale, highly mineralized. The shaft is about 300 ft. northeast from the Maloney workings.

LAWRENCE COUNTY.

GALENA PLACERS.—Two shafts in different places in this group, at Galena, have been sunk, and caught the ore in both at a depth of 100 ft. below the contact from which all the ore has been taken. The lower contact has been exploited by drifts and cross-cuts. The contact is about 3 ft. thick, and dips with the formation. The mine was shut down last week for the reason that there are no reduction works near to treat custom ores.

TORNADO.—The vein in this mine has been opened 1,000 ft. east and west, and in numerous places shows a depth of from 6 to 9 ft. of gold ore. The ore blanket lies fully 400 ft. above the zone now worked, and at the highest point in the district, where a deposit of rich ore has been found.

PENNINGTON COUNTY.

(From an Occasional Correspondent.)

HARNEY PEAK TIN MINING COMPANY.—This company is still in litigation. No active work is in progress, but the company is now conducting systematic prospecting for both gold and tin upon a scale which promises important results. The stigma placed upon this mining region by the ill-advised operations of this company will be removed at no distant date.

UTAH.

JUAB COUNTY.

COLD STORAGE.—The mining claim owned by Reed & Fitzsimmons, and lying between the Sioux and Spy mines, on the east side of the mountain, was sold recently to Colonel Murphy, of Leadville, and it is reported that he will at once open up the property.

MAMMOTH MINING COMPANY.—This company has just completed a tramway from the yard on the tunnel level to the foot of the second-class dump below and are hoisting the ore and passing it through the crushers. The tramway is operated by a separate engine set up for the purpose. A new 40-H. P. compound engine has been received at the mine and will be lowered to the 1,300 ft. level, and the present winze, which is now down to the 1,500, will be carried on to the 1,800 level.

PIUTE COUNTY.

AURORA MINING AND MILLING COMPANY.—This company, of Marysvale, is about to resume work under the management of Henry King. The Aurora has been developed by a 96-ft. tunnel, in the face of which there is a 6-ft. body of ore in which there is a streak of mineral 10 or 11 in. in width that is said to assay 34 oz. silver and \$11 in gold to the ton.

DALTON GOLD AND SILVER MINING COMPANY.—Frank Dalton and Dan Ferguson are reported to have secured a lease upon this company's property in the Marysvale district, and will begin operations at once. Mr. Dalton is the original discoverer of the mine.

MERCUR MILL.—An order has been placed for sixteen additional tanks in this mill, which will increase the capacity of the plant to more than 400 tons a day.

MORNING GLORY.—This mine, near Diamond, in Tintic district, has been worked under lease by H. S. Brooks. Mr. Brooks' lease expired a short time ago, however, and now the company has taken charge again and is putting in a horse whim with the intention of sinking another hundred feet from the present level of the shaft, which is now down to the depth of 180 ft. In the old workings of the mine a drift was run from the shaft on the vein at the 110-ft. level, and stoping was pushed to the surface on ore that carried lead, silver and a little gold.

TOOELE COUNTY.

NEW GUINEA.—In developing this mine, at the head of Government Creek, a shaft was sunk on a small stringer of high-grade bromide ore, but at a depth of 20 ft. the vein was lost. The shaft was continued until a depth of 65 ft. was attained, but no ore was found. While picking into the ground about 20 ft. below the collar of the shaft, at the point where they had lost the ore, a small stringer of mineral was uncovered, and upon drifting upon this for a distance of 4 ft. the stringer widened out into a body of good ore. This was followed by an incline drift, and at 50 ft. the vein widened out into

a 4-ft. body of ore on the footwall that assays 2% lead, from 17 to 60 oz. silver and \$12 in gold to the ton. At this point a winze is being sunk on the ore, while the incline is being continued with two drifts.

WASHINGTON.

OKANOGAN COUNTY.

PALMER MOUNTAIN MINING COMPANY.—This company has been organized and incorporated by M. Drumbeller, C. C. May, F. H. Luce and N. Fred Essig. They own 27 claims on Palmer Mountain. It is their intention to drive a tunnel from some point near the Black Bear for a distance of 3,500 ft.

STEVENS COUNTY.

(From Our Special Correspondent.)

KETTLE RIVER MINES.—Lawrence Hughes, an old-time prospector, has a number of mineral claims on the Kettle River, eight miles south of the international boundary line. Mr. Hughes is interested with a number of prominent mining men in the development of some rich prospects near Bossburg, in the Boundary Creek country. Samples of rock, well mineralized, taken from these claims have been brought into Rosland by Mr. Hughes and have given encouraging assays.

WEST VIRGINIA.

LOGAN COUNTY.

CAMP COAL AND COKE COMPANY.—This company is preparing to open coal mines near Dingess on the new branch of the Norfolk & Western Railroad, reaching an undeveloped coal field from that point.

RITCHIE COUNTY.

LUBECK OIL MINES.—The greatest strike in the Cairo oil field was recently made by this company, on the McFarland farm. The well began to flow over the top of the derrick.

WYOMING.

JOHNSON COUNTY.

(From Our Special Correspondent.)

BURLINGTON GOLD MINING AND MILLING COMPANY.—This company was incorporated last spring. The property is a low-grade gold showing cement, located at Kelley Creek, 12 miles from Buffalo, where they have 24 claims. A small three-stamp prospecting mill demonstrated the fact that stamping is not the proper method for extracting the gold. The cement carries from \$3 to \$5 in gold, but only about \$1.25 was saved by stamping. Some weeks ago they made a deal with Edmond Burke for a cyanide mill. He is to put in a plant with a capacity of 60 tons a day. The machinery is now at Charmont, our railroad station, and the plant is expected to be in operation in 30 days.

JOHNSON COUNTY PROSPECTING COMPANY.—This company has a shaft 30 ft. deep on its claim. An assay certificate from a prominent Denver chemist shows an average lot of their ore to carry 28.65% copper. A local assayer gives them a return of 40% from picked specimens. They are said to be working in a broken formation, and the vein is as yet pockety. They have one plain wall rock of syenite. They have just let a contract for going down 30 ft. further in the shaft. There are several other shafts being sunk in the same vicinity, showing all the way from a trace to 10% of copper, and from \$1 to \$10 in gold per ton. The mines are known as the Bull Camp mines, and are about 30 miles west of Buffalo in the Big Horn Mountains.

POWDER RIVER PLACER MINES.—Omaha capitalists have commenced operations for placer mining on Powder River. They have built five miles of ditch and claim their dirt carries \$30 in gold to the cubic yard.

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

(From Our Special Correspondent.)

FIRE FLY.—Colonel Burke has commenced the development of this mineral claim adjoining the Homestake. The surface showing is similar to the Homestake. Track-laying has commenced on the line of the Northport-Rosland Branch of the Fort Shepherd & Nelson Railway. The greatest difficulty has been experienced in the big rock cuts and in filling the gulches as well as in circling up to get the grade. In one portion near the O. K. mine the road to gain the grade takes a circle, coming within 100 ft. of the other line, and this looping is repeated in several places along the route, showing the nature of the mountains and the upgrade from the Columbia River to Rosland.

HOMESTAKE.—Mr. Haskins, who is superintendent of the Jumbo, in addition to his other duties, is superintending the Homestake with Mr. John Carroll, foreman in charge. A force of men is now engaged in making an excavation on the property for the location of the engine, boiler and hoisting machinery and also for a seven-drill air compressor. It is understood that the Homestake Company has completed its financial arrangements, and that the work of developing the mine will now be vigorously prosecuted.

NICKEL PLATE.—Mr. Williams, who has been in charge of this mine as foreman, has taken a similar position on the California. He has been succeeded by Mr. Peter Cunningham, formerly of the Cour d'Alene, but more recently of the Cariboo mine (Camp McKinney, B. C.).

A considerably increased depth has been attained since the last report of this property, but there has

been some delay awaiting machinery which is now on the way. The Nickel Plate has some very high-grade ore on the dump.

It is not a joint-stock corporation, but is owned by private parties. When the new machinery is placed in position the Nickel Plate will begin to ship ore regularly.

Great progress is noticeable in the vicinity of the Center Star, City of Spokane, Cliff, Monte Cristo, Virginia and Mugwump properties. These lie more or less contiguous to what is known as the gulch. They are close to the great producers of the camp, viz., the War Eagle and Le Roi, and possess additional importance on that account. A number of good frame buildings are being erected in the vicinity of the city of Spokane and judging from a plan of the proposed improvements to be made in a few months, the various managers of these properties have the fullest confidence in the future.

There are now good reasons for believing that those who predicted an output of the Kootenay mines for 1896 amounting to eight or ten millions of dollars have been altogether too sanguine in their calculations. The consensus of opinion of the mine foremen appears to coincide with the conservative estimate editorially made in the *Engineering and Mining Journal* a few months since, when the figures were placed at \$5,000,000. It is possible that it may exceed these figures, but the numbers given appear to be the most probable.

BRITISH GUIANA.

The total exports of gold from the colony for the eight months to August 31st were 71,733 crude oz., valued at \$1,276,291, or 61,746 fine oz. As compared with the corresponding period in 1895 there was a decrease in value of the exports amounting to \$46,046, or 2,228 fine oz. in quantity.

CHINA.

MANCHURIA.

MOUKDEN DISTRICT.—The visions of heaps of gold to be taken up by scraping the ground have not as yet been realized, says a correspondent of the *North China Herald*. The tale is that most of the gold-diggers find it hard enough to make ends meet, and that some of them have thrown up the business in disgust. Knowledge will, however, produce gold in quantities throughout the province in the future. Coal is doing better. There is a town, Yilu, halfway between Moukden and Tiehing, around which coal, cropping out of the ground in many localities has been long begging to be picked up; but *Fengshui* forbade. Now, licenses have been granted, and a good many pits are opened, producing, meantime, heaps of the coal dust so much used by smiths. It is confidently anticipated that at no great depth, coal of a more tenacious kind and of excellent quality will soon be reached. The coalfields are of great extent and lie on or close to the surface. The main Liao River is not more than 20 miles away, and the country level. There should be no difficulty, therefore, ere long in sending down to the port of Newchwang great quantities of good coal. The quality of the coal usually produced in Manchuria excels that of Kaiping.

INDIA.

MYSORE.

COLAR GOLD FIELD.—The productions for the month of August is reported at 26,739 oz. gold, an increase of 6,035 oz. as compared with August of last year. For the eight months ending August 31st the output was 215,890 oz., against 161,303 oz. for the corresponding period last year, 133,806 tons in 1894 and 137,419 oz. in 1893. The production of the several mines in August was: Mysore Reefs, 137 oz.; Balaghat-Mysore, 237 oz.; Mysore West & Wynaad, 474 oz.; Coromandel, 720 oz.; Nundydrooz, 3,918 oz.; Ooregum, 5,109 oz.; Champion Reef, 7,011 oz.; Mysore, 9,133 oz.

MEXICO.

SINALOA.

ANGLO-MEXICAN MINING COMPANY.—These mines are located on the west coast at San Jose de Garcia, about ten days' journey from tidewater, and are owned and controlled by the owners of the Calumet & Hecla mines of Michigan. Mr. Henry R. Batcheller, mining engineer for this company, recently visited the Williams Manufacturing Company's plant at Kalamazoo, Mich., to examine the construction of some cyanide vats being made for them. These vats are 20 ft. in diameter, 5 ft. deep on the inside, and had to be constructed in such a manner as to place them in bundles not exceeding 5½ ft. in length and not be over 150 lbs. in weight, that they might be transported over the mountains on mules. This was done by making a sectional bottom, butting the ends of the sections together and joining them with a steel spline. Mr. Batcheller will set these 12 vats up to work over a lot of ore on the dump that has already been worked, but they estimate that there are 70,000 to 75,000 tons of ore there that will run from \$25 to \$40 a ton. We understand that the Williams Manufacturing Company has made a great many of these cyanide vats this year for parties in Idaho, Montana and Colorado. They construct them out of Washington red cedar, clear stuff.

NEWFOUNDLAND.

CAPE BRAYLE GOLD FIELD.—An expert will shortly examine the gold-bearing quartz outcrop discovered at Cape Brayle. Licenses have already been taken out covering the country for an area of 84 square miles round, and more have been applied for.

NEW GUINEA.

Australian advices report the receipt of 4,000 oz. of gold from placer workings in the island of New Guinea. New placers have recently been discovered on the Mambare River. At the first discoveries on Woodlark Island the number of men is greater than can find work, and many have left for the new placers.

NEW SOUTH WALES.

GREAT COBAR COPPER MINING COMPANY.—This company's report for the half-year ending June 30th states that the output from the mine has continued to increase and is now about 60 tons of fine copper per week. The mine has recently been examined by Mr. John Munday and a favorable report made. The tributors who have been working the property have given notice of their desire to renew the present lease for a period of three years. The company was able to pay dividends amounting to \$20,000 during the half-year.

NOVA SCOTIA.

GEORGES RIVER COPPER MINING COMPANY.—This company's copper mine in Cape Breton, located near the Coxheath copper mine, is now being developed under a bond held by English capitalists. It is reported that a shaft sunk 70 ft. has developed a good vein of copper 6 ft. in width.

ONTARIO.

OPHIR GOLD MINING COMPANY.—The property of this company in the township of Galbraith, district of Algoma, will be sold in the city of Toronto on October 17th, at 12 o'clock noon, by the William Dickson Company, No 73 King street east. The property is 14 miles from Bruce Mines, a station on the Canadian Pacific Railway. Improvements on the property are a substantial frame stamp mill equipped with necessary machinery, an office, assay building, blacksmith shop, buildings for cooking and dining, two bunk houses, icehouse, pump-house, dwelling and stable.

PERU.

CARABAYA GOLD FIELD.—Late advices state that engineers employed by the government to examine the gold mines recently discovered in the province of Carabaya have made a report stating that the mines are of great extent. They consider that the mineral resources deserve exhaustive study. Workings will be opened at once in the mines. The Carabaya province is in the department of Puno, in the extreme southeastern portion of the republic in a mountainous and little known region.

TASMANIA.

MT. LYELL MINING COMPANY.—According to the *Australian Mining Standard*, from June 25th to July 30th inclusive, a total quantity of 2,588 tons of ore has been treated by the one furnace, the average assay value of the ore before treatment being: Copper, 6%; silver, 6.25 oz. per ton; gold, 0.18 oz. per ton. The product obtained from the treatment of the above ore was 224 tons of converter matte, containing: Copper, 114 tons; silver, 9,373 oz.; gold, 320 oz., and also 129 tons of first matte (which has yet to be brought up to "converter matte"), containing: Copper, 28 tons; silver, 1,489 oz.; gold, 78 oz. The gross value of the above products, at present London quotations, is £9,975; the cost was £4,141, leaving an estimated profit of £5,834. The average return per ton was therefore \$18.50; the average cost, \$7.68, and the profit \$10.82 per ton.

LATE NEWS.

DOMINION COAL COMPANY.—The shipments from this company's Nova Scotia mines in September were 148,000 tons; for seven months of the company's fiscal year, from March 1st to September 30th, the shipments were 771,000 tons, an increase of 219,000 tons, or 39.7% over last year.

PHILADELPHIA & READING COAL AND IRON COMPANY.—The statement of this company for August, 1896, shows gross receipts of \$1,593,222 and gross expenses of \$1,529,267, thus showing a profit from mining of \$63,955. Chargeable against this is \$95,000, as one-twelfth of current year's fixed charges, which makes the deficit for the month \$31,045. For August, 1895, the deficit was \$191,872. The deficit for the fiscal year to the end of August is \$1,229,333. For the same months of 1895 the deficit was \$1,397,769.

ALASKA MEXICAN GOLD MINING COMPANY.—This company reports the clean-up for the month of August, as follows: Period since last return, 31 days; bullion shipment, \$16,619; ore milled, 9,263 tons; sulphurets treated, 132 tons. Of bullion there came from sulphurets \$5,098, or 36.2% of the total. The working expenses for the month were \$14,094, leaving a profit of \$2,525. Total return was \$1.79; the expenses, \$1.52; and the net return \$0.27 per ton of ore milled.

ANACONDA COPPER MINING COMPANY.—Reports have been circulated by daily papers in New York and Boston that a conference would be held in New York next week with reference to the transfer of the remaining stock held here to the Exploration Company, of London, under the option given some time ago. These reports are, we understand, at least premature, and there have been no negotiations or arrangements completed except some made necessary by the expiration of the option on Octo-

ber 1st. What may be done hereafter is, of course, another matter entirely and some changes may be expected.

BY TELEGRAPH.

(From Our Special Correspondent)

LEADVILLE, COLO., Oct. 2d.—The conditions here are but little changed. The troops are still here, and matters have settled down. President Boyce, of the Federation of Miners, has been here making inflammatory speeches, and advising men not to declare the strike off. It looks as if a majority of them would take his advice. The Small Hopes people have 125 men working on their two shafts. Nearly 100 of these miners have been imported and all state that they are perfectly satisfied with the conditions here, and will write their friends to come on. The Mahala Mining Company will resume work this week, paying \$2.50 and \$3 a day. The Bison mine is also resuming at \$2.50; this property formerly paid \$3 a day. The most important step is that taken by the Ibox Mining Company. These people will employ over 300 men, and they are putting up a high fence, fully a mile in length, preparatory to resuming. They will pay \$3 a day wages for skilled and \$2.50 for unskilled labor. It looks now as if the strike will slowly wear itself out, and mines will gradually resume on a small scale, until the strike shall be finally declared off.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Oct. 2.

Statement of shipments of anthracite coal (approximate) in tons of 2,240 lbs., for the week ending September 26th, 1896, compared with the corresponding period last year:

	1896.		1895.
	Week.	Year.	
Pennsylvania Railroad.....	77,633	2,606,566	2,697,731

PRODUCTION OF BITUMINOUS COAL, in tons of 2,000 lbs for week ending September 26th, and for years from January 1st, 1896 and 1895:

	1896.		1895.
	Week.	Year.	
Shipped East and North:			
Allegheny, Pa.....	37,454	1,637,012	2,387,564
Berchley, Pa.....	.....	31,437	.....
Beech Creek, Pa.....	.....	\$2,126,932	1,698,058
Broad Top, Pa.....	5,976	283,778	250,133
Clearfield, Pa.....	80,692	3,392,592	3,374,603
Cumberland, Md.....	76,815	2,535,438	2,104,175
Kanawha, W. Va.....	.....	\$2,158,246	2,056,216
Phila. & Erie.....	501	55,774	35,133
Pocahontas Flat Top.....	58,313	2,539,978	1,755,037
Totals.....	259,681	14,821,207	13,672,249

* For year ending September 12th.

† For year ending September 14th.

‡ For year ending September 21st.

§ For year ending September 21st.

	1896.		1895.
	Week.	Year.	
Shipped West:			
Monongahela, Pa.....	18,819	930,317	528,085
Pittsburg, Pa.....	31,866	1,399,313	1,235,350
Westmoreland, Pa.....	27,334	1,385,797	1,218,533
Totals.....	78,019	3,685,427	2,981,968
Grand totals.....	337,700	18,506,634	16,614,217

Production of coke on line of Pennsylvania Railroad for the week ending September 26th, 1896, and year from January 1st, 1896, in tons of 2,000 lbs.: Week, 45,990 tons; year, 3,017,158; to corresponding date in 1895, 4,206,258 tons.

Anthracite.

There is no difference this week in the amount of business doing in anthracite from that of a week ago. A little better demand is reported from along the line and also in New York harbor, but it is very little. The retailers are still doing a fair amount of business, but it will take a protracted cold snap to develop it into a brisk trade. What coal is being mined is being promptly disposed of, but that is due to the production being limited to suit the demand.

There has been some talk of another increase of 25c. a ton in circular prices, but no change has been made. It is said that some of the sales-agents advocated the increase, but it was negated by the majority. It is just as well that the form of ordering the increase was not gone through before the September rise had become really effective. It is a fact well known to the trade that nearly all the transactions of the past month were, at least nominally and in form, deliveries under August circular and that actual sales on September circular were limited to certain kinds of anthracite for which there is always a special demand. It is well known, also, that there is a difference in selling prices, which is very curious when we consider how closely the trade is supposed to be bound, not by an agreement nor a combination, for we are told neither exists, but by "understanding." If a full statement of the actual gross prices realized on tidewater coal by the different companies in September could be obtained, it would probably furnish some very interesting reading.

This is the case in other markets, as well as with tidewater sales. In Chicago and other Western cities the circular is openly cut, agents saying that it is a case of necessity and that otherwise sales cannot be made. In the West there is, of course, the excuse of the competition of soft coal, and the fact that anthracite is rather a luxury than a necessity, but in the tidewater markets this does not apply.

Of course, there are well understood variations in anthracite from different collieries which in an open market would certainly produce differences in

price, and no objection could be made to such a legitimate result of quality as expressed in quotations. The real objection is to the pretense that uniform rates are maintained, when in reality they are not—and every dealer knows it. We have spoken plainly on this point, but not, we think, without sufficient grounds.

NOTES OF THE WEEK.

The Schuylkill Coal Exchange gives notice that the Philadelphia & Reading collieries, drawn to return prices of coal sold in September, 1896, to determine the rate of wages to be paid, show an average price of \$2.60, and the rate of wages to be paid for the last half of September and the first half of October, 1896, is 3% above the \$2.50 basis.

Bituminous.

The soft coal trade is dull and unchanged, the amount of trade doing being so small that there is not much effort on the part of the sellers to dispose of the product. The outlook also is not promising; producers are working on what contracts they have in hand and the few orders they can pick up from time to time. There are some reports of reduced prices being made, but these, if they are made at all, are arranged in such a way that profit cannot be obtained.

It has not been found this year, with the present regular prices, that hard coal in the steam ships has made encroachments upon the use of soft coal, though it was predicted that this would be the case if the association gave out and maintained higher figures than last year. The various consuming territories seem to be taking their usual proportionate consumption. Points east of Cape Cod are slightly more active than others.

The Sound ports are still striving to get ocean freight rates at the low figures of some time ago, but are successful only in very exceptional cases. The freight rates to these points direct are getting up to about the figures where it is more advantageous for Sound consumers to take their coal from New York harbor shipping points. New York harbor shipping ports are taking their usual supplies.

All-rail trade is much in the same condition as New York harbor trade; there seems to be a regular demand, though the total tonnage going forward this year is smaller than last year. Transportation from mines to tide remains excellent; car supply is up to all requirements and could be increased if there was any call for it.

The coastwise vessel market is strong, with vessels in poor supply. Freight rates are, if anything, inclined to advance.

We quote current rates of freight from Philadelphia as follows: To Boston, Salem and Portland 60¢@65c; Providence, New Bedford and the Sound, 55¢@60c; Wareham, 75c; Lynn, 75¢@90c; Newburyport 75¢@80c; Portsmouth, 70c; Dover, \$1, alongside and towage; Saco, 90c, alongside and towage; Bath, 65¢@70c; Gardner, 65c, and towage; Bangor, 80¢@85c. Five and 10 cents above these rates are asked from Norfolk, Newport News and Baltimore.

The Association prices remain as follows: F. o. b. Philadelphia, Norfolk and Newport News, \$2.35; Baltimore, \$2.28; New York Harbor shipping ports, \$2.80, alongside; New York Harbor, \$3. There is a 20c. differential in favor of Clearfield and Beech Creek coals.

Buffalo.

Oct. 1.

(From Our Special Correspondent.)

The anthracite coal trade continues to lack animation; home consumption orders come in slowly and out of town orders are few and far between. The stormy weather now prevailing will help dealers, for fires have become a necessity.

Bituminous coal is quiet; manufacturers are purchasing in small quantities and demand for vessels is considerably reduced in consequence of so many steers; vessels being laid up. The supply is more than adequate for trade requirements and buyers consequently have matters nearly all their own way when arranging for a purchase.

Lake freighting is comparatively light nowadays. A number of owners have decided to cancel their insurance to-day and lay their vessels up. Rates are unchanged.

The movement of anthracite coal by the Erie canal is increasing in volume in consequence of the advance in railroad rates.

The shipments of coal for the past week were widely distributed, as will be seen by accompanying statement of the lake movements. Arrivals for shipments by rail very light.

The shipments of coal westward by lake from Buffalo, from September 20th to 26th, both days inclusive, aggregate only 53,749 net tons, widely distributed as follows: 18,531 tons to Chicago, 10,400 tons to Milwaukee, 5,100 tons to Duluth, 1,200 tons to Gladstone, 3,700 tons to Toledo, 1,000 tons to Marquette, 4,325 tons to West Superior, 388 tons to Midlands, 1,100 tons to Hancock, 600 tons to Detroit, 2,000 tons to Manitowoc, 900 tons to Washburn, 475 tons to St. Clair, 1,100 tons to Bay City, 530 tons to Sturgeon Bay, 600 tons to Saginaw and 1,800 tons to Green Bay. The rates of freight were: 20c. to Chicago, Duluth, Milwaukee, Toledo, Washburn, Marquette, Green Bay, Fort William, Gladstone and Manitowoc; 25c. to Bay City, Hancock and Portage; 35c. to Midlands; 50c. to St. Clair; 40c. to Saginaw and 50c. to Sturgeon Bay. Closing steady, but very dull.

Buffalo will soon be connected with the electric power plant at Niagara Falls. The general manager of the company says that in about two weeks the poles and cables will be completed. About 130

men are at work on the trenches along the towpath of the canal. Severe storms occurred on Tuesday and Wednesday in the Lake districts; many vessels and lives lost.

Chicago. Sept. 30.

(From Our Special Correspondent.)

Anthracite.—There has been a slightly increased demand for anthracite coal in this market during the past week, due undoubtedly to the fact that the weather has been colder, and the close approach of winter has created more demand for small users of coal. The use of bituminous in place of hard coal is very much in evidence, in fact a great deal of wood and even corn is being used as fuel in the country outside of Chicago. The rate on hard coal to Missouri River points has been reduced to \$2 a ton and it is even probable that it will go as low as \$1. The Chicago Great Western road has made a reduction in hard coal carrying rates of from \$2.50 to \$1.90 per ton from Chicago to St. Paul and corresponding reductions to other points on that system. Anthracite coal is quoted for grate, \$5.60; egg, stove and chestnut, \$5.85 f. o. b. cars at Chicago.

Bituminous Coal.—Demand is improving, though to no remarkable extent. The buying is confined chiefly to small quantities, and few contracts for any large amounts are being received. Soft coal sales for manufacturing purposes have not as yet increased.

Coke.—Sales are very limited, in consequence of the continued inactivity of the iron and steel trades.

Pittsburg. Oct. 1.

(From Our Special Correspondent.)

Coal.—There is no change in the mining situation and most of the operators and works have conformed to the new rate. The drivers' wages, about which there has been some friction, have been adjusted, and there seems nothing in sight now, at least, that is likely to disturb the harmony for some time to come. At Charleroi the miners resume at 43c; the strike is declared off. The striking miners returned to work when the arbitration committee declared the percentage of reduction at the thick vein. Monongahela mines brought the rate to 43c. per ton. The men are grumbling at the district officers for advocating the reduction in the mining rate. Cooler weather and a reduced mining rate has stimulated operations in the Pittsburg coal district; nearly all the river as well as the railroad plants have resumed operations. Continued low water is beginning to be felt; a rise in the Ohio would be very acceptable about this time.

Connellsville Coke.—The demand is improving; trade is beginning to look brighter. Shipments increased 80 cars. The slight improvement in the iron trade had a favorable effect generally. The Oliver Coke and Furnace Company will fire up 150 ovens at its No. 1 plant, October 1st; the ovens are being warmed up now in preparation for the start. The large plants of this company, employing nearly 700 men, have been idle since July. The action of the Oliver company indicates the general feeling of confidence throughout the coke region inspired by the conceded defeat of the free silver party. The reported wage reduction at the plant of Jones & McLaughlin is denied.

Summary of the region for the week shows 5,499 ovens in blast with 12,473 idle. The production of the region for the week, estimated upon the ovens drawn, amounted to 52,446 tons against 50,177 tons the preceding week. In the running order, 826 ovens made six days, 4,423 ovens five days, 991 ovens four days, an average of 5-10 days as against 4-90 days the preceding week. The shipment of coke from the region amounted to 3,180 cars.

The shipments were distributed as follows: To Pittsburg and river points, 108 cars; to points west of Pittsburg, 1,050 cars; to points east, 622 cars.

The prevailing price among the large producers is \$2 for furnaces; a few of the small operators are selling for \$1.75.

Thursday a. m., the prospect at this writing is that there will be barge water before the close of the week. The coal loaded does not exceed 3,000,000 bu., as the lower markets have ample supplies of coal on hand; shippers are indifferent; the amount sent out will be small.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Oct. 2, 1896.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From		From	
	Oct. 4, 1895.	Oct. 2, 1896.	Jan., '95.	Jan., '96.	Tons.	Tons.
Anthracite.	49	31,650	31	18,050	845,018	963,769
Coke.....	149	167,700	95	108,189	5,650,894	5,919,504
Charcoal....	21	4,650	23	6,420	163,315	225,065
Totals....	219	203,400	149	132,650	6,659,227	7,111,329

The stronger feeling in financial circles is beginning to have its effect upon the iron market. Some improvement is to be noted in the demand for finished products and manufacturers are beginning to feel sufficient confidence in the future to warrant them in putting in stocks of raw material, or at least in contracting for future deliveries. This movement is assisted by the growing ease in the money market. While the increase in the volume of actual sales is not so great as might be wished

for, the fact that there is an increase is encouraging. The feeling is spreading in the trade that September marked the lowest point of the depression, and that any change hereafter will be for the better.

There is still talk of sales of pig iron to be held for a rise in prices, and these reports, we understand, are not without foundation. The speculative movement at present is in Bessemer pig rather than in foundry irons, and therefore affects the Pittsburg market chiefly. Some remarks on the current course of pig-iron production will be found on our editorial page.

It looks as if heavy steel scrap, suitable for the open-hearth people, was going to be a feature in the market. In addition to the large sale for domestic use reported last week, we have to note the sale of about 10,000 tons of this material for export to Germany. This lot is said to have been obtained, chiefly in Pittsburg, at prices equivalent to \$10.50@ \$11 per ton at tidewater.

A fight is on in the nail trade, which is an interesting illustration of the difficulties encountered by a combine. This trade is at present the most closely controlled and regulated in this country, and since the opposition of the Pittsburg Wire Company and the Baackes mill was bought off it has been supposed that matters were entirely in the hands of the pool. The retail traders generally have resented the course of the combine in keeping nails at prices which are very high relatively to those of other iron and steel products; but they were supposed to be powerless, and could only express their resentment by limiting their buying to the absolute necessities of a summer and fall trade which has been the lightest for a long time. Recently some of the large jobbers, especially in the West, have begun to sell nails below pool prices, and threaten to continue this at any cost, until their demands and those of their customers are met by the manufacturers. Some people say it is a fight of the jobbers to gain control of the pool; perhaps it is also the pool against the natural course of trade. Either way it is a pretty fight.

NOTES OF THE WEEK.

The Minnesota Iron Company directors have decided to pass the October dividend on account of the condition of the ore trade. The company has paid two dividends this year, April and October, of 1 1/2% each.

Washington despatches report that the two Japanese naval constructors who have been in this country for several months examining plans and specifications for two new cruisers for the Japanese government have reported favorably upon bids submitted by Cramp, in Philadelphia, and the Union Iron Works, in San Francisco. It is understood that the formal award for the vessels will be made in a few weeks. The cruisers will be of about 5,000 tons displacement and 22 knots speed.

The Louisville & Nashville Railroad announces new rates on pig iron in carload lots from Southern furnaces to Western points, effective October 1st. To Chicago and Joliet the new rate is \$3.65 from the Birmingham District, \$3.40 from Chattanooga and \$3.40 from the Sheffield District. To Milwaukee, Kenosha, Racine and Waukegan the figures are \$3.85 from Chattanooga and Sheffield and \$4.10 from Birmingham. To Indianapolis the rate is \$3 from Chattanooga and Sheffield and \$3.25 from Birmingham. To Dubuque, Galena, Muscatine, Ia., and Savannah, Ill., the rate is \$3.85 from Chattanooga and Sheffield and \$4.10 from Birmingham.

New York. Oct. 2.

The local market is a little more lively, so far as inquiries are concerned, and there has been some improvement in sales, especially of pig, bar iron and plates. The structural market, however, is very dull; but little new work is coming in and old contracts are pretty well filled. The local street railroad work which was expected this summer was stopped by financial difficulties, and very little of it has been done.

Pig Iron.—Sales are increasing slightly and there is a good deal of inquiry, especially from New England points. Southern iron is much firmer, the speculative movement having relieved the furnaces a good deal. While there is no change in nominal prices, it is no longer possible to buy iron at the low rates quoted privately two or three weeks ago, and we have marked up quotations on Southern brands accordingly. The export of pig iron has been checked a little by the increase in ocean freight rates, which are now very high.

We quote for Northern iron: No. 1 foundry, \$12@ \$12.75; No. 2, \$11.25@ \$11.75; gray forge, \$10.50@ \$11. For Southern iron we quote: No. 1 foundry, \$11 @ \$11.50; No. 2 foundry, \$10.50@ \$11; No. 1 soft, \$10.50 @ \$11; No. 2 soft, \$10@ \$10.50; forge, \$9.75@ \$10.25. Basic pig is offered at \$10.75@ \$11. All prices are for tidewater delivery.

Cast-Iron Pipe.—No new contracts were let this week. The season for ordering pipe is nearly over and nothing large is expected just now.

Spiegeleisen and Ferro-Manganese.—No business of consequence is reported. Ferro-manganese is quoted at \$46.50@ \$47 for imported 80%, New York.

Steel Billets and Rods.—The pool prices are \$21.75, New York, for Bessemer billets, and \$23.75, New York, for open-hearth billets. Very little business is noted. Rods are \$28@ \$29, with few sales.

Merchant Iron and Steel.—A little more busi-

ness is reported. For bars we quote: Common, 1'10@1'15c.; refined, 1'20@1'45c.; soft steel bars, 1'20@1'30c. Other quotations are: Steel hoops, 1'50@1'60c.; steel axles, 1'60@1'75c.; links and pins, 1'60@1'70c.; tire steel, 1'80@1'90c.; spring steel, 1'95@2'15c. All prices are for delivery on dock, New York.

Plates.—Sales are a little better, but there is no change in prices. We quote for universal mill plates, 1'30@1'40c. For steel plates we quote: Tank, 1'35@1'45c.; boiler shell, 1'45@1'55c.; good flange, 1'60@1'75c.; firebox, 2@2'40c. Charcoal iron plates are quoted 2'25c for shell, 2'75c. for flange, and 3'25c. for firebox. Rivets are 2'15@2'25c. for steel and 3@3'25c. for iron.

Structural Iron and Steel.—The only new contract reported is a small one for bridge steel. Local shops are getting short of work. There is no change in prices. We quote for angles, 1'35@1'40c.; channels, 1'70@1'75c.; tees, 1'65@1'70c.; beams, 1'70@1'75c. for large orders, and 1'80@1'90c. for small lots.

Wrought-Iron Pipe.—Small orders out of store make up about all the business. Discounts are as follows for plain pipe, out of store: 1 1/2 in. and over, 67, 10, 10, 10 and 5%; 1 1/4 in. and under, 57, 10, 10, 10, and 5%. Galvanized pipe, 1 1/2 in. and over, 55, 10, 10, 10 and 5%; 1 1/4 in. and under, 52, 10, 10, 10 and 5%. Boiler tubes, 1 in. to 2 1/2 in., 70, 10 and 5%; 2 1/2 in. up, 70 and 5%. Cold-drawn seamless steel tubes, 60%.

Nails.—The pool price continues \$2.55 per keg f. o. b. Pittsburg for steel wire nails, and \$2.30 per keg f. o. b. Pittsburg for cut nails. Business is in a much disturbed condition, and some jobbers are selling below pool rates. There is a general determination, apparently, among retailers to buy only what they are compelled to.

Steel Rails and Rail Fastenings.—The combination price is still \$28.75 per ton at tidewater or \$28 at mill, for heavy sections. Girder rails are \$29@ \$31, tidewater. No business is reported here.

Little is doing in rail fastenings. Angle-bars are 1'15@1'25c. and spikes 1'60@1.65c., tidewater delivery. Bolts are 1'85@1'95c. for square nuts, and 1'95 @2'05c. for hexagon nuts.

Old Rails.—Old iron rails are quoted \$12.50@ \$13.50, New York. Old steel rails are quoted \$10@ \$11.50, with a sale reported at \$10.50, Jersey City. Old steel rails fit to relay, standard sections, can be had at \$20@ \$22, New York harbor, according to conditions.

Scrap Iron.—Demand is moderate and chifty for good lots. Prices, as usual, depend very much on size or nature of lots. We continue to quote \$10@ \$11.50 for good machinery; \$8.50 @ \$9.50 for ordinary cast scrap; \$6@ \$7.50 for stove-plate and mixed.

Chicago. Sept. 30.

(From Our Special Correspondent.)

There is increasing confidence, and consequently the iron and steel trade has seen a fair week's business. Consumers are gradually opening up and in a number of lines the aggregate sales will foot up larger than those of the preceding week. Prices are stiffening, though there has been no actual advance in any line. The steel rail, billet and rod markets appear to be the only lines that have not gained within the past few weeks, though there is rather more inquiry observed in each commodity. There has been heavier buying in structural material, bar iron and merchant steel.

Pig Iron.—Several thousand tons of pig iron were sold in this market during the week, representing both the Northern and the Southern product. The situation in the manufacturing trades has not improved much, and it is a fact that many large concerns are still merely buying enough for immediate requirements. We quote: Lake Superior charcoal, \$13.50@ \$14; local coke foundry No. 1, \$11.25@ \$11.75; No. 2, \$10.75 @ \$11.25; No. 3, \$10.25@ \$10.75; local Scotch foundry No. 1, \$11.25@ \$11.75; No. 2, \$10.75@ \$11.25; Southern coke No. 1, \$11.10@ \$11.35; No. 2, \$10.85@ \$11.10; Southern No. 1, soft, \$10.85@ \$11.10; No. 2, soft, \$10.85@ \$11.10; Southern silveries No. 1, \$11.35@ \$11.85; No. 2, \$11.10 @ \$11.35; Jackson County silveries, \$14@ \$16; Ohio strong softeners, \$14@ \$14.25; Alabama car-wheel, \$16.25@ \$16.75; malleable Bessemer, \$12.25 @ \$12.50.

Bar Iron.—A better run of small orders is observed, while a few fairly large contracts have been booked. Still the majority of buyers merely take enough for temporary wants. Prices are for common iron 1'30c., and for guaranteed 1'35@1'40c.

Steel Rails.—Small quantities represent the sales of rails and the prospect has not improved materially. Inquiry has improved somewhat. Rails are quoted \$29, Chicago.

Billets and Rods.—The rod mills at Joliet continue in operation, enough business being in hand to warrant them in remaining open for at least six weeks. But few sales of billets are noticed. Billets are quoted \$21.25 and rods \$27.50.

Structural Material.—Railroad bridge material continues in much better demand than steel for building purposes. A few buildings out of town are at present being bid on, but do not represent any large tonnage. Quotations are as follows: Beams and channels, 1'70@1'75c.; angles, 1'30@1'35c.; plates, 1'35@1'40c.; tees, 1'50@1'55c.

Merchant Steel.—Sales have increased slightly and inquiry has developed somewhat. The outlook

is rather better and prices are held fairly well. Prices are: Smooth finished tire, 1.55@1.60c.; machinery steel, 1.85@1.95c.; tool steel, 5.50@7c.

Old Rails and Wheels.—There is but little business doing. Old iron rails are quoted about \$11, and old wheels, \$11.50.

Cleveland. Sept. 30.
(From Our Special Correspondent.)

Iron Ore.—The iron-ore market during the past week has encouraged the brokers somewhat. They did not expect that much business would be done, if any, but some small lots of ore have been sold, among them a few tons of non-Bessemer ores. There was only a moderate call for Bessemer ores, which, like the non-Bessemer, were for special purposes. The hope of any further large call for ores is not entertained by the brokers. The quotations follow. No. 1 specular Bessemer, \$4.50@4.75; Bessemer hematites, \$4@4.25; non-Bessemer hematites, \$2.10@2.50; Mesabi non-Bessemer, \$2.10@2.25.

The end of the season is clearly indicated in the condition of lake transportation. Boats are being placed in ordinary or laid up daily.

Pig Iron.—There is a better feeling in the pig-iron market and the improvement which was noted several weeks ago is still apparent. No large sales have been reported, but a number of small sales of foundry iron were made during the week. One encouraging feature of the market is the inquiries made with a view to speculative investment. Following are the quotations: Lake Superior charcoal, \$13.50; No. 1 foundry iron, \$11.75; No. 2, \$11.50, No. 1, Ohio Scotch, \$12.25; No. 2, \$11.75; Bessemer pig, \$11.75; Mahoning and Shenango Valley neutral mill irons, \$10; Mahoning and Shenango Valley red short mill, \$10.25.

Philadelphia. Oct. 2.
(From Our Special Correspondent.)

Pig Iron.—Brokers and agents say that actual melting of iron in foundries has increased, but not enough to be visible in demand; and that mills are not melting much more now than a month ago. A few are, but some are doing less. While the talk is that concessions are not to be thought of it would not be safe for a large buyer to trifle. Makers are ready and anxious to do business, and cannot see where pig iron is going to advance. As to an advance in pig this year, it is nice to talk about, but there are too many people who have iron to turn into money. The activity in Western markets may soon reach us, but Eastern consumers are taking things most unconcernedly. No. 1 foundry is \$12.50; No. 2, \$11.75; gray forge, \$10.25@11; Bessemer, \$13 asked, and low phosphorus, \$15 asked.

Steel Billets.—It will have to be more clearly demonstrated than it has been yet that the billet pool has the power to dictate prices before our people will do much buying.

Merchant Bars.—All replies are unfavorable. Mills have been quoting very low for business without getting as much as they asked for. Store sales show some improvement over warm weather sales. Our people have been driven against the wall by successive reductions and can offer no more inducements. Carload lots are offered at 1.20; steel bars, 1.25.

Sheets.—As long as half time is the rule there is no use to talk about better prices. A good deal of stock has been recently shipped to stores.

Skelp.—Mills run very irregularly and prices are so close to cost basis that some manufacturers take no interest in the scramble that is sure to ensue when a little business is to be given out.

Merchant Steel.—Some winter business was placed this week for special steels. There are some encouraging enquiries for machinery and tire steel.

Pipes and Tubes.—The lowest possible prices have been quoted to secure business and it does not come.

Plate and Tank.—The big orders have not been announced (shipyard business), but we hope to get a small slice. The mills, with one or two exceptions, are in the same half-starved condition as to work as they have been in for months past. The fall orders are away below expectations. Tank plates are 1.30; universals, 1.40; shell, 1.45; flange, 1.60.

Structural Material.—A truthful report of the iron trade necessitates a repetition of what has been said for several weeks past. Some disappointment is expressed over the fact that so much less business has been booked than was figured out as sure. Angles are 1.30; beams and channels, 1.70.

Steel Rails.—The only information given out is that expenditure for repairing and new tracklaying will be minimized as much as possible until there is a decided improvement in traffic.

Old Rails.—A big trade or two has been worked up, but it is not to take effect until the roads want the new steel rails. Old iron rails are \$14.

Scrap.—Mill men and others have been looking around a good deal, with a view of knowing where to put their hands on scrap when it will be wanted.

Pittsburg. Oct. 1.
(From Our Special Correspondent.)

Raw Iron and Steel.—Increased business as well as increased confidence has been developed during the week. Iron and steel and other industries continue to indicate improvement. The growth of industrial output has been in part anticipatory of improved demand for raw and finished products and a

decided strengthening of confidence, in the prospect for future business is apparent throughout the industry. A number of plants that have been idle for some time past have resumed operations and others are preparing to do so. Pig iron improves slowly, keeping pace with the business situation, but not leading it. Several furnaces and mills have resumed, not because they have many orders ahead, but because they are counting upon a rapid improvement in business. As a matter of fact, orders are not what they ought to be at this season of the year. Speculators are still purchasing pig iron and so keep prices from declining, and furnace men and mill men are making efforts to introduce their products into foreign countries; but after all the volume of business is far below what we have a right to expect, taking the time of year into consideration.

Finished Material.—The demand is slowly improving, principally for limited amounts; holders firm, without quotable change. In steel rails nothing is doing of importance; the port prices continue in full force, \$28 per ton. For steel wire rods the demand is improving; prices have declined. Muck bar was more inquired for; prices show little change.

Latest.—The skies continue to brighten. Business is improving; the volume of trade and transactions are increasing. For steel billets demand is light, but prices increasing; they vary from \$19.50 to \$20.25. Foundry No 2 is firm, with a liberal increase in transactions. Muck bar is firmer; steel wire rods advancing. Taken as a whole, everything favors a good fall and winter business.

COKE, SMELTED, LAKE AND NATIVE ORE.		BLOOMS, BILLETS AND SLABS AT MILL.	
Tons.	Cash.	Tons.	Cash.
3,000 Bessemer, Oct., Nov., Pitts.	\$11.75	2,000 Tin Plate Bars, at mill	\$22.25
3,000 Bessemer, Nov., Dec., Jan., Valley	10.75	2,000 Billets, Oct., at mill	20.25
2,500 Bessemer, Oct., Nov., Pitts.	11.75	1,500 Slabs, prompt, at mill	20.25
1,500 Bessemer, Oct., Nov., Pitts.	11.85	500 Billets, spot, at mill	19.50
1,500 Grey Forge, Oct., Pitts.	9.60	300 Billets, Oct., at mill	19.75
1,000 Gr. v. Forge, Sept., Oct., Pitts.	9.90	MUCK BAR.	
1,000 Bessemer, Oct., Valley	10.75	700 Neutral, delivered, Pitts.	\$19.75
1,000 Gray Forge, Oct., Nov., Pitts.	10.00	200 Neutral, delivered, Pitts.	26.00
1,000 Bessemer, Oct., Valley	10.75	BLOOMS, BILLETS AND BAR ENDS.	
100 Gray Forge, Oct., Pitts.	10.15	3,000 Bloom ends, Pitts.	\$11.50
1,000 Bessemer, Spot, Valley	10.60	SHEET BARS.	
1,000 Gray Forge, prompt, Pitts.	10.10	1,000 September, Pitts.	\$22.75
1,000 No. 2 Foundry, Oct., Pitts.	11.50	FERRO MANGANESE.	
500 No. 1 Foundry, spot, Pitts.	12.15	90 80% Imported, Pitts.	\$50.75
150 Grey Forge, spot, Pitts.	9.60	STEEL WIRE RODS.	
150 No. 1 Foundry, spot, Pitts.	12.00	1,000 5-gauge, Pitts.	\$25.60
CHARCOAL.		SKELP IRON.	
100 Ext. Warm Blast, Pitts.	\$21.00	300 Shear, ed, Pitts.	\$1.30 4 m.
50 Cold Blast, Pitts.	23.25	300 Wide groov'd, Pitts.	1.15 4 m.
50 No. 2 Foundry, Pitts.	16.00	250 Narrow grooved, Pitts.	1.15 4 m.
25 Cold Blast	23.50	SKELP STEEL.	
		500 Narrow grooved, Pitts.	\$1.20 4 m.
		350 Wide grooved, Pitts.	1.00 4 m.
		350 Shear'd, Pitts.	1.00 4 m.

METAL MARKET.

NEW YORK, Friday Evening, October 2, 1896.
Gold and Silver.

Prices of Silver per Ounce Troy.

September & October.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$1.	October.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$1.
26	483 3/4	30 3/8	65 1/2	.508	30	484 3/4	30 3/8	65 1/2	.508
28	484	30 3/8	65 1/2	.508	1	484 1/2	30 3/8	65 1/2	.509
29	484 1/4	30 3/8	65 1/2	.508	2	484 1/2	30 3/8	65 1/2	.509

The silver market has been without features during the week and almost without fluctuations; at the close it is a little stronger.

The United States Assay Office in New York reports the total receipts of silver at 80,000 oz. for the week.

Gold and Silver Exports and Imports.

At all United States ports, August, 1896, and years from January 1st, 1896 and 1895:

	Coin and bullion.		In ores.		Total excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
GOLD					
Aug.	\$1,972,544	\$4,045,885	.....	\$231,227	E. \$2,364,568
1896.	55,511,811	30,718,510	.....	\$79,256	E. 23,701,356
1895.	55,766,217	28,090,483	.....	320,769	E. 26,864,326
SILV.					
Aug.	5,301,431	929,122	.....	1,359,668	E. 3,021,946
1896.	40,932,418	7,712,939	.....	370,575	E. 21,586,071
1895.	33,265,216	6,199,471	.....	61,920	E. 18,982,179

This statement includes the exports and imports

at all United States ports, the figures being furnished by the Bureau of Statistics of the Treasury Department.

Gold and Silver Exports and Imports, New York
For the week ending October 2d, 1896, and for years from January 1st, 1896, 1895, 1894, 1893 and 1892:

	Gold		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
We'k	\$9,500	\$6,424,369	\$747,238	\$12,137	E. \$5,678,768
1896.	40,396,348	52,420,445	29,729,800	2,119,059	E. 15,586,844
1895.	57,994,222	25,929,909	30,230,423	1,396,225	E. 6,898,511
1894.	82,440,250	14,451,616	27,543,737	1,323,083	E. 94,299,258
1893.	70,077,341	57,775,352	24,510,815	2,931,368	E. 33,881,466
1892.	58,777,248	7,024,287	16,813,744	2,116,821	E. 66,449,884

The gold exported for the week went to the West Indies; of the silver \$118,937 went to France, \$1 to the West Indies, and the remainder to London. The specie imported came chiefly from Europe.

Average Monthly Prices of Silver

in New York and London, per ounce Troy, from January 1st, 1896, and for the years 1895 and 1894.

Month.	1896.		1895.		1894.	
	Lon. Pence.	New York Cents.	Lon. Pence.	New York Cents.	Lon. Pence.	New York Cents.
January	30 69	67 13	27 36	59 69	30 81	66 63
February	31 01	67 67	27 47	59 90	29 18	63 43
March	31 34	68 40	28 33	61 98	27 28	59 49
April	31 10	67 92	30 39	66 61	28 95	61 92
May	31 08	67 88	30 61	66 75	28 69	62 96
June	31 46	68 69	30 47	66 61	28 63	62 40
July	31 45	69 75	30 48	66 75	29 82	62 45
August	30 93	67 34	30 40	66 61	28 29	61 83
September	30 19	65 68	30 54	66 90	38 88	64 14
October	.....	.....	30 89	67 64	28 69	63 06
November	.....	.....	30 79	67 40	39 41	65 13
December	.....	.....	30 40	66 47	27 78	60 43

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

FINANCIAL NOTES OF THE WEEK.

The general feeling in business is gradually improving, for the same reasons which we have remarked for several weeks past. The money market is easier, demand and prices are improving on many lines, and there is more confidence in the future. The improvement is shown by an increasing demand for currency among other matters, and shipments from New York to interior points have been heavy. The deposits of gold made at the New York Sub-Treasury for shipments of currency, which were only \$40,000 in July, rose to \$1,912,000 in August and \$6,110,000 in September.

Gold imports at New York since the movement began have reached \$40,000,000, and the receipts at San Francisco from Australia have been \$4,500,000 more. The rise in sterling exchange this week, however, indicates that the movement is nearly at an end. The Treasury statement given below shows that the gold reserve increased net \$4,369,548 during the week, and further gains are expected.

The United States Treasury statement shows that the total receipts for September were \$24,584,244, of which \$11,374,116 was from customs, \$11,679,137 from internal revenue and \$1,530,991 from miscellaneous sources. The only increase is about \$900,000 in miscellaneous, which comes from the seigniorage on silver bullion coined. The expenditures for September were \$26,579,535. The total receipts for the quarter ending with September this year have been \$79,175,550, of which \$35,860,943 has been from customs, \$37,943,007 from internal revenue and \$5,371,600 from miscellaneous sources. The receipts for the same quarter of 1895 were \$85,572,072, of which \$44,369,998 was from customs, \$37,330,519 from internal revenue, and \$3,871,555 from miscellaneous sources. The expenditures during the quarter just ended were \$104,369,679. The corresponding figures for 1895 were \$95,456,730. The increase for the quarter is due largely to the payment of \$5,000,000 for sugar bounties under the decision of the Supreme Court. The excess of expenditures for the quarter was \$25,194,129 this year, against \$9,884,653 for the corresponding quarter last year.

The statement of the United States Treasury on Thursday, October 1st, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

	Sept. 21.	Oct. 1.	Changes.
Gold	\$119,665,124	\$124,034,672	E. \$4,369,548
Silver	16,929,111	16,082,617	D. 846,494
Legal tenders	66,984,235	62,828,716	D. 4,155,519
Treasury notes, etc.	35,132,143	35,040,233	D. 91,910
Totals	\$238,710,613	\$238,986,228	E. \$275,615

Treasury deposits with national banks amounted

Baltimore.**	Week, Oct. 1.		Year, 1896.	
	Exp.	Imp.	Exp.	Imp.
Bismuth metal, cases.....				52
Chrome ore..... long tons				4,801
Copper, fine..... "	1425		25,718	
" matte..... "			509	
" sulphate..... "			2,109	
Iron ore..... "		5,953		309,906
" pigs, bars..... "				
" ingots, blooms..... "	150		150	2,621
Iron oxide..... bags				300
" pyrites..... long tons			150	
Ferro-manganese..... "			251	1,458
" nose..... "				70
Ferro-silicon..... "			4,058	
Lead..... "	1225			2,743
Limestone..... short "			21	9,648
Manganese metal, long "	25		81	410
Spiegeleisen..... "				7,836
Steel..... "				9,037
Steel wire, bundles..... "	1,171			2,484
Tin, long tons..... "	68		325	130,183
Tin and black plates, boxes		630		388
Zinc (spelter) long tons.....				

**From our special correspondent.

Philadelphia.††	Imports.	
	Week, Sept. 26.	Year, 1896.
Antimony, casks.....		102
Copper ore, long tons.....	2,710	16,610
Ferro-manganese, long tons.....	142	717
Ferro-silicon..... "		485
Iron ore, long tons.....	3,200	211,682
" pig..... "		600
" and steel scrap, long tons.....		618
Manganese ore, long tons.....		4,561
Spiegeleisen..... "		134
Tin..... "		416
Tin and black plates, boxes.....	2,107	42,118

†† From New York Metal Exchange Reports.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Oct. 2.
Heavy Chemicals.—Aside from the slightly better demand for certain products and the firmer feeling that accompanies it there is no change to report in this market. Prices are unchanged, and remain firm at the following quotations: Caustic soda, 60%, \$2.22½@ \$2.42½; 70, 74@76%, \$2.12½@ \$2.37½ per 100 lbs. Alkali, 58%, 82½@90c. for 50-ton lots and over, and 90c.@ \$1 for smaller quantities; 48%, \$1.20@ \$1.40 for jobbing lots. Bleaching powder, prime brands, \$1.75@ \$1.87½; Continental, \$1.65@ \$1.75 per 100 lbs. Bicarb soda, English, 140c. @2c.; American, bulk, \$1.50@ \$1.50 per 100 lbs. Sal-soda, English, 70@72½c.; American, 65c. (in barrels), 80c. (in kegs) per 100 lbs.

Acids.—More activity prevails in the acid market than we have been able to report for some time. The business for September has been quite good, better, in fact, than during any other month of the present year. Inquiries are coming in from buyers for contract figures for next year, but manufacturers defer giving quotations until after election. All contracts that have been suggested have been on a gold basis, and at a 10c. advance for next year over present prices. There has been an advance in the price of acetic acid due to greater inquiry, the color mixers now coming into the market for their annual supply. We quote: Acetic acid in barrels, \$1.25@ \$1.40; in carboys, \$1.35@ \$1.50; muriatic acid, 18°, 75c.; 20°, 75@85c.; 22°, \$1.10@ \$1.25, according to make and quantity. Nitric acid, 36°, \$3.25 @ \$4.36; 40° \$4@ \$4.50; 42°, \$4.50 @ \$5.50. Oxalic acid, \$7.25 ex-dock and \$7.50 ex-store. Mixed acids, according to mixture. Sulphuric acid, 66°, 75@95c., 10@15c. higher for small quantities. Chamber acid, \$6@ \$6.50 per ton at factory. Blue vitriol, \$4@ \$4.25, according to grade and order.

Brimstone.—This market shows no special feature during the past week. It remains uniformly firm, with no indication of an advance, but rather a tendency toward a falling off in the price recently given. Best unmixeds have been sold during the week for \$22.75, which is also the spot quotation. This is a decrease of 25c. per ton over the figure of a week ago. Quotations for October and November shipment are \$20½ per ton; and 75c. a ton less for thirds. Business is reported to be quiet.

Fertilizing Chemicals.—This market shows some improvement and prices are reported to be stronger along the line. It is said that the quotations given for some time past would have been shaded had buyers made fair offers to purchase, but that now they are firmly held. A good deal of inquiry continues to come from the South, and consumers there have begun to buy. Several lots have been disposed of during the week to them. Prices are as follows: Sulphate of ammonia, gas liquor, \$2.15@ \$2.17½; bone, \$2.05@ \$2.10 per 100 lbs. Dried blood, high grade, \$1.60 per unit, New York; low grade, fine ground, \$1.35 f.o.b. Chicago. Azotine, \$1.60 basis New York. Concentrated phosphate (30% available phosphoric acid), 57½c. per unit. Acid phosphate, 13½ @15%, av. P₂O₅, \$4@65c. per unit at seller's works in bulk. Dissolved bone black, 17% to 18%, P₂O₅, 85c. per unit. Acidulated fish scrap, \$8.50@ \$9, and dried scrap \$16.50@ \$17 f.o.b. fish factory. Tankage, high grade, \$18@ \$18½; low

grade, \$17½@ \$18. Bone tankage, \$21; ground bone, \$22@ \$22.50. Bonemeal, \$19.50@ \$21.

Sulphate of Potash: 90-95%, New York and Boston, \$1.90½; Philadelphia, Baltimore and Norfolk, \$1.98; Southern ports, \$2.

Double Manure Salts: 48-53%, New York and Boston, \$1.01; Philadelphia, Baltimore and Norfolk \$1.02; Southern ports, \$1.03½.

Muriate of potash: The new prices are 178c. at New York and Boston; 179½c. at Philadelphia, Baltimore and Norfolk, and 181½c. at New Orleans for 80@85% (basis of 80%), in lots of 50 tons and upward.

Kainit.—Quotations for 1896 are as follows: New York, Boston, Philadelphia and Baltimore, \$8.80 per ton; Norfolk, \$9.15, and New Orleans, \$9.30 per ton, for 25 tons and upward. Sylvinit at the same ports is quoted at 36½c., 37½c. and 38c., respectively.

Nitrate of Soda.—The prices quoted are 177½@ 180c. for spot, according to quantity; 180c. to arrive, and 182½@ 185c. for futures.

NOTES OF THE WEEK.

The Lamont Chemical Works, which established itself at Kent, Pa., some years ago to manufacture acetate of lime, charcoal and naphtha, has taken out articles of incorporation as a company. The capital stock is \$50,000.

On September 24th there was received at San Francisco 3,025 tons of sulphur from Girgenti, Sicily. This is probably the largest cargo of brimstone ever landed at this port. It is rare that such an importation is made from Europe, as most of the sulphur consumed in California comes from Japan.

The shipments of phosphates from Bone, Algeria, for the six months ending June 30th, 1896, were 8,745 tons in 1894; 45,410 tons in 1895, and 80,371 tons in 1896.

Exports of alkali and bleaching materials from the United Kingdom for the year ending July, 1896, as compared with 1895, are officially reported as follows, in hundred weights:

To.	1895.	1896.
United States.....	235,514	136,852
British North America.....	17,731	20,436
Australasia.....	25,552	18,208
European countries.....	96,859	91,096
Other countries.....	119,935	84,231
Total, cwt.....	491,591	351,853

	1895.	1896.
United States, etc.....	85,050	52,342
Other countries.....	42,271	34,302
Total, cwts.....	127,351	86,644

The total exports of alkali and bleaching materials from the United Kingdom show a decided decrease this year due chiefly to lighter shipments to the United States.

Liverpool. Sept. 23.

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

On the spot there is little moving in heavy chemicals, but there is a fair inquiry for contracts over 1897, and business done on private terms, although most consumers do not appear eager to contract ahead at present.

Soda ash is in light demand, while spot quotations are nominally unchanged, the nearest range for tierces, according to market, being about as follows: Leblanc ash, 48%, £4@ £4.5s.; 58%, £4 5s.@ £4 10s. per ton, net cash; ammonia ash, 48%, £3 5s.@ £3 10s.; 58%, £3 10s.@ £3 15s. per ton, net cash; bags are 5s. per ton under price for tierces.

Soda crystals are inactive, but steady at £2 7s. 6d. per ton, less 5% for barrels, and 7s. less for bags.

Caustic soda is weaker and orders are scarce. Spot range, as to market, we quote about as follows: 60%, £6 5s.@ £6 7s. 6d.; 70%, £7 5s.@ £7 7s. 6d.; 74%, £8 2s. 6d.@ £8 5s.; 76%, £8 17s. 6d.@ £9 2s. 6d. per ton, net cash.

Bleaching powder is in poor request, and slow at £6 12s. 6d.@ £7 per ton, net cash, for hardwood packages as to market.

Chlorate of potash is sick at nominally 4¼d. per lb., while buyers hold aloof.

Bicarb. soda is quiet at £6 15s. per ton, less 2¼%, for the finest quality in 1-cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia is quite neglected and nominally quoted at about £7 16s. 3d.@ £8 per ton, less 2¼% for good gray, 2¼@25% in double bags f. o. b. here, as to quality.

Nitrate of soda is maintained at £8 2s. 6d. @ £8 5s. per ton, less 2¼% for double bags f. o. b. here, according to quality, but only a retail business passing.

Carb. ammonia, lump, 3d. per lb.; powdered, 3¼d. per lb., net cash.

MINING STOCKS.

Complete quotations will be found on pages 331 and 335 of mining stocks listed and dealt in at:

New York.	Aspen, Colo.	St. Louis.
Boston.	Colorado Springs.	Paris, France.
Philadelphia.	Duluth, Minn.	Mexico.
Baltimore.	Helena, Mont.	Shanghai, China.
Pittsburg.	Salt Lake, Utah.	Valparaiso, Chile.
Denver, Colo.	San Francisco.	London, England.
Cleveland, page 332.		

NEW YORK, Friday Evening, Oct. 2.

Eighteen stocks, with recorded sales of 20,900 shares, helped to make the mining stock market a

little more active than it has been. Business on both the Consolidated Stock and Petroleum Exchange and the New York Stock Exchange has been merely professional; outside buyers have been few and far between.

The Comstocks have ruled low with regard to prices, but their aggregated sales exceeded those made last week.

Comstock Tunnel shows transactions of 1,000 shares at 6c.—the lowest price at which sales were made for many weeks. Consolidated California & Virginia opened at \$1.75, rose to \$1.80 and closed at \$1.75 with dealings of 300 shares. Chollar sold 100 shares this week at \$2—35c. less than when the last sale was made some weeks ago. Crown Point, on the other hand, rose in price from 36c. two weeks ago to 50c. on September 28th, with sales of 200 shares. Other sales were as follows: 100 shares of Ophir at 95c.; 200 shares of Sierra Nevada at 60c.; 300 shares of Yellow Jacket at 20@30c.

Colorado stocks have been more active this week, and we report 1,500 shares of Creede & Cripple Creek at 8@9c., 4,200 shares of Croesus at 2c., 1,000 shares of Leadville at 12c., 1,000 shares of Leadville at 12c., 1,300 shares of Mt. Rosa at 16@20c., 2,500 shares of Pharmacist at 11@12c., and 100 shares of Victor at \$6.88. There were three California stocks dealt in—Bulwer, with sales of 800 shares at 46c.; Brunswick Consolidated, with 4,500 shares at 22@24c., and Syndicate with dealings of 1,350 shares at 2c.

We note dealings of 50 shares of Ontario at \$10, the only Utah stock traded in for some time.

The Arizona stock, Phoenix, shows sales of 1,400 shares at 4@6c.

The officers of the new mining exchange to which we referred last week held a meeting in the office of the treasurer, Dr. William Brandreth, in this city, the following Board of Governors being elected. Irving C. Stump, Benjamin T. Marten, of the New York Stock Exchange; E. D. Foster, William P. Mitchell, and James R. Branch, secretary of the American Bankers' Association.

There will be two more gentlemen on the Board of Governors with whom the officers intend to close negotiations this week. We understand, however, that some of the gentlemen above mentioned have not yet accepted. The permanent headquarters of the Exchange will probably be at No. 38 New street.

Cleveland. Sept. 30.

(From Our Special Correspondent.)

It was reported by the stock brokers to-day that there had been no trading in mining stocks during the past week. The dull condition of the market, it was said, was due to two causes, the closing down of several of the mines and the agitation on the financial question. At the offices of the principal brokers of the city it was said that the inquiries for stock had been so few that no notice had been given them, and that for all practical purposes there were no bids. The quotations, however, are the same this week as last, as follows:

Name of Company.	Par val.	Sept. 30.	
		Bid.	Ask.
Aurora.....	\$25	\$6.00	\$8.00
Biwabik.....	100	32.00	34.00
Champion Iron Company.....	100	10.00	30.00
Chandler.....	25	34.00	35.00
Cincinnati Iron.....	25	10.00	13.00
Cleveland-Cliffs Iron Company.....	100	45.00	.....
Jackson Iron Company.....	25	70.00	75.00
Lake Superior Iron Company.....	25	30.00	31.00
Lake Superior Consolidated.....	100	20.00	21.00
Minnesota.....	100	43.00	44.00
Pittsburg & Lake Anseline.....	25	.....	75.00
Republic Iron Company.....	25	18.00	.....

Boston. Oct. 1.

(From Our Special Correspondent.)

The market for mining stocks the past week has been quite active, especially in the copper stocks, dealings in which have been more general throughout the list, although Boston & Montana continues to be the favorite with speculators, as well as with investors. The prospect of an increased dividend has stimulated the price, carrying it up to \$91½, the highest point, with reaction to-day to \$89½, but making a net gain for the week of \$4. The transactions have reached about 27,000 shares.

Old Dominion has had a fairly good share of the business, selling up to \$17½, with only a slight reaction at the close.

Kearsarge advanced from \$13 to \$14 on good buying. The reaction to-day carried it back to \$13½. Osceola sold at \$28, but later declined to \$27, closing rather weak. Calumet & Hecla advanced to \$315, and Quincy from \$107½ to \$112. Tamarack opened at \$90, but did not hold, selling off to \$85 without any apparent cause for so doing. Tamarack, Jr., sold at \$13, but declined to \$12 in later reports. Tecumseh advanced \$1—to \$4, on the good reports from the mine, losing \$½ on later sales. Wolverine, after selling at \$7½ declined to \$7. Franklin sold at \$11, a gain of \$1; and Atlantic at \$18½ for a small lot. Butte & Boston advanced to \$3½ and closed at \$3. Sales of Centennial, assessment of \$2 paid, were reported at \$11½@ \$12½. Arnold declined from \$1½ to \$1½.

In gold stocks, with the exception of Pioneer, the

dealings have been very light. Pioneer sold up to \$6 1/2 early in the week, but the advance was lost in later sales, closing at \$5 1/2. Santa Ysabel advanced from \$9 1/2 to \$10, losing it in final dealings. Merced sold at \$8 1/2 @ \$8 1/4; and Gold Coins at \$2 1/2 @ \$2 1/4. The market closed dull with a slight tendency to lower prices.

Salt Lake City. Sept. 26.

(Special Report of James A. Pollock.)

Taken as a whole, the week in the local mining stock market was a fair one, there being a gratifying increase in outside buying. While Ajax did comparatively little, the stock was fairly well sustained. The properties are reported to be in admirable condition and shipments of ore are being increased. Anchor was somewhat more in demand and the stock recorded an advance. Alliance did nothing. While Bullion-Beck was slightly shaded, there was no good reason for it. Bogan was inactive. Some activity was displayed by Centennial-Eureka in the sale of odd lots. There is but little of this stock on the market, however, and quotations usually apply to small holdings only. Dalton recorded little or no change. The parties holding a lease on the old workings are just commencing operations. Dalton & Lark was without feature. Daly did little business, there being few buyers in the field. Daly-West continued strong, although there was little activity. Notwithstanding reported sales of a large block of stock in the East, East Golden Gate was offered far down at the close, the asking quotation on Thursday being 2c. This is the lowest point the stock has yet reached. Eagle and Four Aces did little, but there was a slightly increased inquiry for the latter at the close. Galena received some high-grade ore during the week. The stock remained about unchanged, as did also Geyser. Horn Silver was again inactive. Mammoth will pay its usual dividend of 5c. per share, October 1st. The stock did considerable business at about the previous week's quotations. Mercur did more business than for some time past, the buying being largely from the outside. Some heavy shipments of cyanide product are being made. Ontario did little, and quotations were unchanged. The September dividend has been declared. Overland is pushing development work. Silver King remained strong, with only light business. Sioux Consolidated is largely in the hands of leasers, which condition is likely to continue. Swansea was considerably stronger, there being more buyers in. Toward the close it weakened somewhat again. South Swansea was strong and advanced materially. Utah stock was unchanged. Gold Dust now has its executive committee figuring on a milling proposition.

San Francisco. Sept. 26.

(From Our Special Correspondent.)

The market has been so dull all the week that there is really nothing to note. The dealings have been light, prices weak, and no one has taken any interest in business. If matters get any worse the exchanges might as well close.

Chollar sold to-day \$2.10 @ \$2.15; Consolidated California & Virginia, \$1.65 @ \$1.70; Hale & Norcross, \$1.40 @ \$1.45; Confidence, \$1.30 @ \$1.40; Bodie Consolidated 63c.; Bulwer, 42c.

On the Gold Mining Exchange business has also been very light and the directors have been consulting over some plan to revive interest in the call board.

Quotations noted are: Lockwood, 28c.; Savannah, 46c. The Comstocks now called on this board range about the same as on the Stock Board.

A little light is in prospect. On Monday at the Stock and Bond Exchange a resolution was passed unanimously that on and after this date no dealings in local securities will be permitted between the members of that exchange and the members of the San Francisco Stock and Exchange Board. The reasons for this declaration of war are well understood here, but would have little interest outside.

A special meeting of the stockholders of the Bodie Consolidated Mining Company has been called for October 13th to ratify the acts of the directors and to authorize the sale of the property of the company to the Standard Consolidated Mining Company on the plan already published. A meeting of the Bulwer Consolidated stockholders will be called soon for the same purpose. The Mono stockholders have already authorized the sale of their property.

The Marguerite Gold Mining and Milling Company, of Auburn, Placer County, has levied an assessment of 20c. per share; delinquent November 10th.

Assessments have been levied by the following mining companies of Jordan District, Mono County: Goleta 20c., Sterling 15c., and Montecito 15c. per share. They will all be delinquent in office November 2d.

London. Sept. 19.

As in several recent weeks the mining market continues to be dull and featureless. The South African section has been particularly dull and has been relieved only by a little flutter in deep levels and African Gold Recovery. As regards the deep levels, some encouragement has been given to those desirous of it by the publication of an explanation of the very bad results for August at the Goldenhuis Deep, to which I referred in my letter last week. It is stated that the expenses were unusually high because of the erection of new stamps, etc., and that the cyanide plant is not giving good results, so that

the electro-cyanide process is to be adopted. These explanations may satisfy some people, but they are of the nature of temporary makeshifts. It is to be feared that the deep level is not so productive as was expected, and that the general cost of mining is more than was calculated on. The African Gold Recovery Company's shares have been prominent all week on the publication of a report that the validity of the MacArthur-Forrest patent had been upheld by the Transvaal courts. The company, however, denied that any such judgment had been published. It is impossible to tell how the facts stand, but it is possible that a judgment has been arrived at, though no official publication has been given of its exact terms.

The West Australian and New Zealand markets have been far from active; Indians and Americans are also lifeless.

Paris. Sept. 20.

(From Our Special Correspondent.)

I have still to report a market somewhat agitated by foreign politics. The uncertainty as to England's action and the almost certainty that the Eastern question is to be revived have exercised an unfavorable influence upon affairs, which is in some degree assisted by the probability of further trouble in the Spanish finances.

In one aspect the situation may be called amusing. It is of the most ridiculous to see our insular neighbors moved on one side by what they call their conscience, but which is really the hope of plunder, and on the other by the fear that Russia may secure the greater share of the breaking up of the Turkish empire is hastened. It is time that Britain may find in Asia Minor and Armenia new Egypt to absorb; but if Russia insists upon Constantinople, what then? Our friends across the Channel are not satisfied simply with securing their share from the wreck; they do not wish anyone else to have anything.

The greatest activity is still found in the metallurgical stocks, which continue at a high level. The speculation in the copper stocks has decreased, though most of them hold their prices well.

Still another attempt is being made to work up a rise in the Transvaal gold stocks, on the strength of the increase in production shown in August. It is evident, however, if we consider the increase in machinery at work and the number of new mines, that the Witwatersrand statement for that month shows really a relatively low output. The amount must rise to at least 620,000 or 270,000 oz. a month before we can talk of gains. The disposition here is not to buy, but rather to sell when it can be done without loss. Moreover, most of the companies need not only a greater production, but a decrease in expenses.

The foreign commerce of France for the eight months ending August 31st is reported by the Ministry of Commerce as below:

	1895.	1896.
	Francs.	Francs.
Imports.		
Food.....	640,786,000	715,288,000
Raw materials.....	1,391,573,000	1,506,066,000
Manufactures.....	375,260,000	410,956,000
Total.....	2,407,620,000	2,632,850,000
Exports.		
Food.....	361,429,000	396,281,000
Raw materials.....	572,902,000	539,530,000
Manufactures.....	1,133,317,000	1,178,730,000
Postal parcels.....	74,118,000	95,754,000
Total.....	2,141,766,000	2,210,295,000
Excess, imports.....	265,854,000	412,555,000

A statement prepared by our Ministry of Public Works gives as follows the length of railroad in each country of Europe, and the order in which each country stands with regard to the territory and to the population. Germany occupies the first place with a total of 46,451 km., of which 27,447 km. are in Prussia; France had 40,209 km.; Russia and Finland, 35,560; Great Britain and Ireland, 33,641; Austria-Hungary, 30,899; Italy, 15,057; Spain, 12,052; Sweden, 9,755; Belgium, 5,660; Switzerland, 3,527; Holland and Luxemburg, 3,102; Roumania, 2,741; Portugal, 2,340; Denmark, 2,267; Turkey, including Bulgaria and Roumelia, 2,199; Norway, 1,777; Greece, 930; Serbia, 540; Malta, Jersey and the Isle of Man, 110. In the length of line with regard to the territory, Belgium occupied the first place, followed by Great Britain and Ireland; Malta, Jersey, and the Isle of Man; Holland and Luxemburg; Germany; Switzerland; France; Denmark; Italy; Austria-Hungary; Portugal; Spain; Roumania; Sweden; Greece; Serbia; Turkey; Russia, and Norway. Relative to the population, Sweden had 20 km. per 10,000 inhabitants; Switzerland, 11.9; France, 10.5; Denmark, 9.9; Germany, 9; Norway, 8.8; Great Britain and Ireland, 8.7; Belgium, 8.2; Austria-Hungary, 7.1; Spain, 6.7; Holland and Luxemburg, 6.2; Roumania, 5.1; Italy, 4.8; Portugal, 4.6; Greece, 4.2; Russia, 3.7; Malta, Jersey and Man, 3.4; Serbia and Turkey each 2.4.

Signs continue to multiply in Europe of a coming period of prosperity; but it will not be fully realized unless your condition improves. Such is the solidarity of the world's commerce in this age. AZOTE.

MEETINGS.

Ben Hur Mining and Milling Company, at rooms 10 and 11 Bank Block, Colorado Springs, Colo., on October 20th at 10 a. m.

Carbonate King Mining Company, at the office of Shober & Rasch, Gold Block, Helena, Mont., on October 10th, at 12 m.

Vendome Gold Mining Company, at 420 Equitable Building, Denver, Colo., on October 7th, at 2 p. m.

West Fisk Gold Mining Company, at 8 Congress street (room 17), Boston, Mass., on October 27th, at 3 p. m.

ASSESSMENTS.

Name of Co.	Loc'n.	No.	Dirq.	Sale.	Amt.
Alta Silver.....	Nev.....	53	Oct. 12	Nov. 2	.10
Hay State.....	Cal.....	33	Sept. 30	Oct. 20	.03
Bullion.....	Nev.....	48	" 18	Oct. 8	.19
Hunker Hill.....	S. D.....	8	" 21	" 21	.002 1/2
Christmas.....	Utah.....	3	Oct. 10	" 27	.002
Crown Point					
Gold and Silver	Nev.....	68	Sept. 22	" 13	.20
De Soto Gold.....	Cal.....	1	Oct. 17	Nov. 16	.07
Dutch Canyon.....	Utah.....	"	" 6	Oct. 31	.01
Gold Queen.....	"	"	" 17	"	.30
Gould & Curry.....	Nev.....	79	" 5	" 27	.15
Leo.....	Mont.....	"	Sept. 28	" 19	.004 1/2
"North Banner	Cal.....	40	Oct. 19	Nov. 9	.02
Con. Tunnel.....	Nev.....	21	" 8	Oct. 29	.10
Opbir Silver.....	"	69	" 7	" 27	.25
*Orient Gold	Cal.....	"	" 10	" 17	1.00
Placer.....	"	2	Sept. 25	" 10	1.25
Original Empire.....	S. D.....	4	" 12	" 12	.002
Providence.....	Utah.....	"	" 9	" 9	.05
Sevier.....	"	"	"	"	
Sierra Nevada	Nev.....	111	" 11	" 1	.25
Silver.....	S. D.....	8	" 26	" 17	.001
Transit.....	Nev.....	53	" 28	" 22	.20
Union Con. Silv.	"	23	Oct. 13	Nov. 2	.05
Utah Con.....	"	"	"	"	

* New assessment.

DIVIDENDS.

NAME OF COMPANY	Current Dividends.		Paid since Jan. 1, 1896.	Total to date.
	Date.	Am't.		
*Aetna Con.....			\$30,000	\$70,000
Alaska-Mexican.....			52,200	155,031
Alaska Treadwell.....			275,000	2,950,000
Anaconda.....			750,000	750,000
Aurora Iron.....			50,000	700,000
Bangkok-Cora Bell.....			6,000	107,510
Big Six.....			2,500	2,500
Boston & Mont.....			1,050,000	4,475,000
*Bullion Beck & Ch.....			185,000	2,135,000
*Calumet & Hecla.....			2,000,000	46,350,000
*Cariboo.....			48,000	111,000
*Centennial-Eureka			300,000	1,830,000
C. O. D.....			5,000	25,000
Dalton & Lark.....			87,500	87,500
Daly.....			37,500	2,857,500
Deadwood Terra.....			100,000	1,240,000
Dominion Coal.....			600,000	106,000
Elkton Con.....			30,000	106,000
Florence.....			54,390	89,348
*Galena.....			31,000	51,000
Gold Coin.....			65,000	80,000
*Golden Eagle.....			10,000	10,000
Golden Fleece.....			132,000	533,179
Gold & Globe Hill.....			19,500	28,875
Hecla Con.....			30,000	2,130,000
Helena & Frisco.....			50,000	475,000
Highland.....			25,000	3,159,918
*Homestake.....			282,250	5,993,750
Hope.....	Oct. 1	10,000	30,000	622,252
Horn Silver.....			50,000	5,130,604
Iowa.....			30,000	40,000
*Iron Mountain.....			35,000	145,000
*Isabella.....			180,000	2,250
Jackson.....			7,500	2,500
Le Roi.....			125,000	200,000
Mammoth.....	Oct. 1	20,000	40,000	1,130,000
*Mercur.....			150,000	500,000
Minnesota Iron.....			495,000	3,240,000
Mont. Ore Pur. Co.....	Oct. 15	40,000	320,000	480,000
Moon-Anchor.....			24,000	24,000
Moose.....			6,000	186,000
Napa Con.....	Oct. 1	120,000	70,000	810,000
*New Elkhorn.....			72,000	72,000
Ontario.....	Oct. 1	15,000	150,000	13,310,000
Osecola Con.....			125,000	2,072,500
Ottawaquechy.....			1,000	1,000
Portland.....			150,000	773,000
Quincy.....			70,000	8,370,000
*Silver King.....			337,500	787,500
Sacramento.....			2,000	2,000
*Slocan Star.....			200,000	290,000
Small Hopes.....			25,000	3,275,000
Smuggler-Union.....			100,000	100,000
*Swansea.....			5,000	6,500
Tamarack.....			150,000	4,320,000
Union.....			23,500	73,000
*Utah.....			19,000	151,500
Victor.....			140,000	605,000
Victor M. & L.....			12,000	42,000
War Eagle.....			25,000	157,000
Wasp.....			40,000	40,000
Totals.....			\$105,000	\$10,147,440
				\$124,426,823

* September dividend paid. † Extra dividend of 10c. per share included.

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

STOCK QUOTATIONS.

BOSTON, MASS. Table with columns for Name of Company, Location, Par value, and dates from Sept. 25 to Oct 1. Lists various companies like Allouez, Arnold, Atlantic, etc.

NEW YORK. Table with columns for Name of Company, Location, Par value, and dates from Sept. 26 to Oct 2. Lists various companies like Adams, Ajax, Alamo, etc.

* Official quotations Boston Stock Exchange. Total sales, \$4,181.

INDUSTRIAL COAL AND COAL RAILROAD. Table with columns for Name of Company, Par value, and dates from Sept. 26 to Oct 2. Lists companies like Balt. & Ohio, Ches. & Ohio, etc.

* Official quotations N. Y. Stock Exchange. Total shares sold, 192,161.

Table with columns for Name of Company, Location, Par value, and dates from Sept. 26 to Oct 2. Lists companies like Adams, Ajax, Alamo, etc.

* Official quotations N. Y. Stock and Con. Stock & Petroleum Exchanges. Total shares sold, 20,907.

COLORADO SPRINGS, COLO. Table with columns for Name of Company, Par value, and dates from Sept. 21 to Sept. 26. Lists companies like Ajax, Alamo, Anaconda, etc.

* Official quotations and sales Colo. Springs Mg. Stock Assoc. * Board of Trade Exchange.

ST. LOUIS, MO. Week ending Aug. 25. Table with columns for Name of Company, Company's Office, Par value, Bid, Asked, and Last Dividend.

SAN FRANCISCO, CAL. Table with columns for Name of Company, Location, Par value, and dates from Sept. 25 to Oct 2. Lists companies like Alta, Belcher, Best & Belcher, etc.

* Official telegraphic quotations, San Francisco Stock Exchange.

BALTIMORE, MD. Week ending Oct. 1. Table with columns for Name of Company, Location, Par value, Bid, Ask, and Name of Company, Location, Par value, Bid, Ask.

* Official quotations Baltimore Stock Exchange.

BRITISH COLUMBIA. Week ending Sept. 26. Table with columns for Name, Selling price, Name, Selling price, Name, Selling price.

Par val.: Hall Mines, Jumbo and Le Roi, \$5; other stocks \$1.

LONDON. Table with columns: NAME OF COMPANY, Country, Product, Capital stock, Par value, Last dividend, Quotations (Buyers, Sellers), and various company names like Nth Americans, Alaska, De Lamar, etc.

DENVER, COLO. Table with columns: NAME OF COMPANY, Par value, Sept 21, Sept 22, Sept 23, Sept 24, Sept 25, Sept 26, and various company names like L'd Mines, Anaconda, Bankok, etc.

* Dividend pending. † Reconstruction or increase of capital pending. ‡ Ex-dividend.

PARIS. Week ending Sept. 18. Table with columns: NAME OF COMPANY, Country, Product, Capital Stock, Par value, Div. last year, Prices (Op'ing, Closing), and various company names like Acieries de Creusot, Fives-Lille, etc.

SALT LAKE CITY, UTAH. Week ending Sept. 26. Table with columns: STOCKS, Par value, Bid, Asked, Actual selling price, and various company names like Horn Silver, Little Pittsburg, etc.

MEXICO. Week ending Sept. 17. Table with columns: NAME OF COMPANY, State, No. of shares, Last dividend, Last assessment, Prices (Opening, Closing), and various company names like Amistad y Concordia, Angustias, etc.

PHILADELPHIA, PA. Table with columns: NAME OF COMPANY, Location, Par value, Bid, Asked, Selling price, and various company names like Arc'lene'l'Co, Cambria Iron, etc.

VALPARAISO, CHILE. Aug. 6. Table with columns: NAME OF COMPANY, Capital, Share value, Last dividend, Prices (Bid, Asked, Last sale), and various company names like Arturo Prat, Caracoles, etc.

HELENA, MONT. Week ending Sept. 19. Table with columns: NAME OF COMPANY, Location, Company's office, Par value, Bid, Asked, Shares sold, Price, and various company names like Am. Dev. & M. Co., Bald Butte, etc.

SHANGHAI, CHINA. Aug. 21. Table with columns: NAME OF COMPANY, Country, No. of shares, Value, Last dividend, Price, and various company names like Jelehu Mg. & Trad., Funjon Mg. Co., etc.

PITTSBURG, PA. Week ending Sept. 28. Table with columns: NAME OF COMPANY, Location, Par value, Bid, Asked, Selling price, and various company names like Mansfield, N.Y. & C. Gas Co., etc.

* Official quotations Philadelpha Stock Exchange. Total sales, 9,452. * Official quotations Pittsburg Stock Exchange.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns for Name and Location of Company, Capital Stock, Shares (No., Par Val, Total Levied), Assessments (Date and Amount of Last), Dividends (Total Paid, Date and Amount of Last), and Name and Location of Company, Capital Stock, Shares (No., Par Val, Total Levied), Assessments (Date and Amount of Last).

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. + The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. † Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends and the Cons. Virginia \$42,300,000. ‡ Dividends paid since consolidation. NOTE.—Corrections to this table are made monthly. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.

CLASSIFIED LIST OF ADVERTISERS.

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Burling Rock Drill Co.
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Fraser & Chalmers.
Ingersoll-Sergeant Drill Co.
(See Diamond Drills.)

Air Hoists.
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Connorsville Blower Co.

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Philadelphia Eng. Wks. Ltd.
Pollock, Wm. B. & Co.

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Freese, E. M., & Co.

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(See Machinery.)

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Whiting Foundry Equipment Co.

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New York Diamond Drill Co.
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Cunningham & Co.
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Clayton Air Compressor Works.
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Allis Co., Ed. P.
Bink, Theo. A.
Bradley Pulverizer Co.
Colorado Iron Works.
Denver Eng. Works Co.
Fraser & Chalmers.
Fraser Vanner Concentrator.
Hendrie & Bolthoff Mfg. Co.
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(See Machinery.)

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American Metal Co.
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Atlantic Mining Co.
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Canadian Copper Co.
Copper Queen Mfg. Co.
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Roessler & Hasselacher Chemical Co.
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Laxow, Theodor.
New York Diamond Drill Co.

Diamond Drills.
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Mfg. Co., M.C.
Laxow, Theodor.
New York Diamond Drill Co.
Sullivan Machinery Co.
(See Air Compressors and Rock Drills.)

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Young, Wm. B.

Drawing Materials.
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Chicago School of Assaying.
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Mass. Inst. of Technology.
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Rose Polytechnic Institute.
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ing Co. |
(See Wire Rope Tramway and Machinery.)

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Besley, Chas. H., & Co.
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Engineers, Chemists, Metallurgists
See Directory Pages 4, 5 and 6.

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Bullock & Crenshaw | Lietz Co.
Fauth & Co. | Mann & Co.
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Ingersoll-Sergeant Drill Co.
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(See Machinery.)

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American Diamond Rock Drill Co.
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Blake, T. A.
Bradley Pulverizer Co.
Bull, C. M. C. Mfg. Co.
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Colorado Iron Works.
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Cookson & Co.
Denver Eng. Wks. Co.
Elliott's Metal Co., Ltd.
Electro Cyanide Gold & Silver Ext'n Co.
Foster, Blackett & Wilson.

Mine Cars.
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Hunt, C. W. Co.
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(See Machinery.)

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Cunningham & Co.
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(See Machinery.)

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Brown, Horace F.
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Atlantic Dynamite Co.
Ingersoll-Sergeant Drill Co.

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American Fertilizer, Arms & Explosives, Australian Mg. Stand. Bulletin, Denver Republican, El Minero Mexicano, Electrical Plant & Electrical Industry, Financial Times, Indian Engineering, Iron & C. Trade Review, McNeill's Code, Mining Journal, Scientific Pub. Co., So. African Mg. Jour., Zeitschrift für Practische Geologie.

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Crescent Steel Co. | Ltd.
Moore, S. L., & Sons Co. | (See Metal Dealers)
(See Metal Dealers)

Tanks.
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Gates Iron Works. | Williams Mfg. Co.

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Carpenter Steel Co. | Treuton Iron Co.

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Brown Holst. & Conv. | Fraser & Chalmers.
Machine Co. | Hunt, C. W., Co.
California Wire Wks. | Roebing, J. A. Son
Colorado Iron Works. | & Co.
Denver Eng. Wks. Co. | Vulcan Iron Works.

POSITIONS VACANT.

FREE ADVERTISING

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

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

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

1482 WANTED—TWO TECHNICALLY educated young men for electric furnace work residing in or near New York City. Work is hard and exacting, but chances good for right men. Reply fully. Address ELECTRON, ENGINEERING AND MINING JOURNAL.

1483 WANTED—A SUPERINTENDENT to erect and manage a dynamite factory. Must have had successful practical experience in this line. Address DYNAMITE, ENGINEERING AND MINING JOURNAL.

1484 WANTED.—A MILL MAN WITH some experience, who understands concentrating ores by Cornish Jig process, to act as night foreman in small concentrating plant in northern part of Mexico; must speak Spanish. State salary, which must be moderate to commence with. Address CONCENTRATOR, ENGINEERING AND MINING JOURNAL.

1485 WANTED.—A CHEMIST TO TAKE charge of a small chlorination mill treating pyritic concentrates containing gold, silver and a little copper. Address OREGON, ENGINEERING AND MINING JOURNAL.

1486 WANTED.—A MAN TO TAKE ENTIRE charge of a mining property in Mexico; must be a first-class man and thoroughly conversant with the management of Huntington Mills and chlorination; one who speaks Spanish preferred; permanent engagement, with good prospects, given to first-class man. Address INDEPENDENCIA, ENGINEERING AND MINING JOURNAL.

1487 WANTED—FOR A SOUTH AMERICAN Copper-Silver Smelting Works, a thoroughly competent manager, to erect and superintend the same. While it is proposed to smelt only to a matte at first, the manager should be thoroughly conversant with all the processes used in the treatment of copper and silver ores; conditions—water power, cheap wood, dear coke, good climate, altitude 3,000 feet above sea. ARGENTINA, ENGINEERING AND MINING JOURNAL.

1488 WANTED—AN ENGINEER AND Assayer who has had experience in the mines of the Ouro Preto District, Brazil. Address with full particulars, F. F. F., ENGINEERING AND MINING JOURNAL.

1489 WANTED—A MAN ACQUAINTED with lead smelting, sweep smelting, cupellation and refining and desulfurizing processes, to run a small blast furnace and refinery in South Africa. A technical graduate preferred, but practical experience absolutely necessary, as well as tact and ability to manage men. A man between 30 and 40 years of age preferred. A good salary will be paid to the right party, who will be expected to return it in a responsible position. Address TRANSVAAL, ENGINEERING AND MINING JOURNAL.

1491 WANTED—A FIRST-CLASS MILLMAN who thoroughly understands amalgamation and concentration of gold ores and assaying; state experience, age and wages expected; none in one of the Southern States. Address THOROUGH, ENGINEERING AND MINING JOURNAL.

1492 WANTED—A YOUNG MAN WHO is competent as an analytical chemist, with some experience as an engineer, can find a situation at a moderate salary with a mining company in Virginia, by furnishing satisfactory testimonials of his character, ability and experience. Address MINING COMPANY, ENGINEERING AND MINING JOURNAL.

1493 WANTED—BY AN IRON COMPANY —A General Superintendent to take charge of a blast furnace plant, with coal mines and coke ovens. Applicant must be thoroughly qualified in modern blast furnace practice. Preference will be given to a man of technical education. Good position for a man of thorough experience and ability. Address IRON, ENGINEERING AND MINING JOURNAL.

SITUATIONS WANTED.

Advertisements for SITUATIONS WANTED will be charged only 10 cents a line.

WANTED—POSITION. LONG AND varied experience in opening and working mines of coal, gold, silver, copper, lead and zinc ores; in concentration, smelting and milling; in planning and erecting works; in examination of mining lands. Address H. C., ENGINEERING AND MINING JOURNAL. No. 17,489, Oct. 10.

POSITION WANTED BY A PRACTICAL Metallurgist and Chemist; competent to run a smelter, cyanide or chlorine leaching work; best references. Address H. COLO., ENGINEERING AND MINING JOURNAL. No. 14,310, Oct. 10.

CHEMIST, GRADUATE STATE UNIVERSITY, desires employment in works, foundry or office; has had two years' experience clay and iron laboratories; can invest several hundred dollars, together with services, in small chemical business. Address JOURNAL, 737 Monadnock Block, Chicago, Ill. No. 14,826, Oct. 81.

MINING ENGINEER OF OVER 20 YEARS' experience in Gold and Silver Exploration, Mining and Milling, desires to change location. No objection to foreign countries or the tropics; 10 years as superintendent and general manager; speaks Spanish; New York, Chicago and London references. Address ORO, ENGINEERING AND MINING JOURNAL. No. 14,812, Oct. 10.

POSITION WANTED BY ASSAYER AND Chemist, graduate of technical school; experienced with smelter and mine work; out of work on account of Leadville strike; best of reference. Address BOX 672, Lake Geneva, Wis. No. 14,811, Oct. 10.

POSITION WANTED BY YOUNG CHEMIST and assayer with cyanide chlorination company or sampling works; has smelter experience; good ore sampler and buyer; best of references. Address H. B., ENGINEERING AND MINING JOURNAL. No. 14,813, Oct. 10.

MINING AND MECHANICAL ENGINEER of executive ability and 20 years' experience is open for engagement with first-class company, as superintendent or resident manager; specialty, erection and treatment of low-grade ores; speaks German and Spanish; references the best. Address A. L., ENGINEERING AND MINING JOURNAL. No. 14,819, Nov. 7.

CHEMIST.—YOUNG MAN, GRADUATE OF technical school, desires position; has had practical experience in both blast furnace and foundry; best references. Address CIVIS, ENGINEERING AND MINING JOURNAL. No. 14,818, Oct. 10.

WANTED—A POSITION AS MANAGER or superintendent. Long and varied experience in California, Nevada and North Carolina in opening and working mines, both free-milling and subphurized; also in placer mining. Can erect and run all machinery. Will go anywhere for a good company, at moderate salary, until company is convinced of my ability. Reference given, and bond, if necessary. Address J. D. S., ENGINEERING AND MINING JOURNAL. No. 14,816, Oct. 10.

WANTED—A SURVEYOR WANTS A situation as an assistant in a mine; fair draftsman. Industrious and sober. Wages \$50 per month. Address Box 57, Oshawa, Ont., Can. No. 14,819, Oct. 10.

CONCENTRATION — WANTED.—A POSITION as Manager or Superintendent by a man 44 years old; 4 years' technical, 15 years' practical experience in Colorado in Mining, Milling and Concentration; 4 years with last company at \$3,600. Specialty: Concentration and Amalgamation; will start on moderate salary; highest references. Address G. A., ENGINEERING AND MINING JOURNAL. No. 14,825, Oct. 10.

ASSAYER AND CHEMIST, GRADUATE of Northwestern University, '95, desires position; experience limited; best of references. Address N. W. U., No. 14,827, Oct. 24.

THROUGH EXTRAORDINARY CIRCUMSTANCES a mining engineer and superintendent of the widest experience and very best reputation, referring to absolutely the highest authorities in America and Great Britain, is open to offers of engagement. Prefers management of mines; experience as such in Colorado, Montana, California, Central and South America. Specialty: concentration, lixivation, mine management and treatment of base auriferous ores; thorough surveyor and assayer. Salary not less than \$5,000 per annum. Address MONTANA, ENGINEERING AND MINING JOURNAL. No. 14,821, Oct. 10.

MINE BLACKSMITH—A FIRST-RATE Mechanic, able to do well everything, from setting diamonds in a drill to the heaviest forging. An excellent, industrious, sober man, desires a permanent position, where he will get high wages—which he will earn—and have good educational advantages for his children. He has the very best references. Address BLACKSMITH, ENGINEERING AND MINING JOURNAL.

Contracts Open.

TREASURY DEPARTMENT, OFFICE SUPERVISING ARCHITECT, Washington, D. C., September 15th, 1896.—Sealed proposals will be received at this office until 2 o'clock p. m., on the 28th day of October, 1896, and opened immediately thereafter, for all the labor and materials required for the interior finish of basement, first story, etc., of the U. S. Post Office, Washington, D. C., in accordance with drawings and specification, copies of which may be had at this office or the office of the superintendent at Washington, D. C. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid, if it be deemed in the interest of the government to do so. All bids received after the time stated will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked "Proposal for the interior finish, etc., for the U. S. Post Office, Washington, D. C." and addressed to WM. MARTIN AIKEN, Supervising Architect. (Orig.)

DREDGING.—U. S. Engineer Office, 39 Whitehall Street, New York.—Sealed proposals for dredging in Lemon Creek, Staten Island, N. Y., will be received here until October 17th, 1896, and then publicly opened. Information furnished on application. H. M. ADAMS, Major Engrs.

DREDGING.—U. S. Engineer Office, 1637 Indiana Avenue, Chicago Ill.—Sealed proposals for dredging Chicago River, Ill., about 1,300,000 cu. yds., will be received here until October 21st, 1896, and then publicly opened. Information furnished on application. W. L. MARSHALL, Major Engineers.

TREASURY DEPARTMENT, OFFICE SUPERVISING ARCHITECT, Washington, D. C., September 18th, 1896.—Sealed proposals will be received at this office until 2 o'clock p. m., on the 20th day of October, 1896, and opened immediately thereafter, for all the labor and materials required for the low-pressure, return circulation, steam heating and ventilating apparatus, for the U. S. Post Office Building at Allegheny, Pa., in accordance with the drawings and specification, copies of which may be had at this office or the office of the Superintendent at Allegheny, Pa. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid should it be deemed in the interest of the Government to do so. All proposals received after the time stated for opening will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked, "Proposal for the Heating and Ventilating Apparatus for the U. S. Post Office Building at Allegheny, Pa." and addressed to WM. MARTIN AIKEN, Supervising Architect. Orig.

TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C., September 28th, 1896.—Sealed proposals will be received at this office until 2 o'clock p. m. on the 29th day of October, 1896, and opened immediately thereafter, for all the labor and materials required for the stone and brick work, roof covering and interior finish above second story (except plumbing, gas piping, heating apparatus, elevators and electric wiring) of the U. S. Appraiser's Warehouse at New York, N. Y., in accordance with the drawings and specification, copies of which may be had at this office or the office of the superintendent at New York, N. Y. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all bids or to waive any defect or informality in any bid should it be deemed in the interest of the Government to do so. All proposals received after the time stated will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked, "Proposal for Stone and Brickwork, Roof Covering and Interior Finish, etc., for the U. S. Appraiser's Warehouse at New York, N. Y." and addressed to WM. MARTIN AIKEN, Supervising Architect. Orig.

RAILROAD BRIDGE.—Sealed Proposals will be received by the Portland & Rumford Falls Ry. at the Chief Engineer's office, in Rumford Falls, Maine, until October 16th, 1896, for a heavy steel railroad bridge 600 ft. long, across the Androscoggin River, near Chisholm's Mills, Maine. Profile and specifications will be sent on application. WALDO PETTINGILL, Vice-President.

STEEL RAILS.—Supply of 150,000 tons of steel rails and other permanent way materials, to be manufactured in the Colony of New South Wales. Offers are hereby invited by the Government of New South Wales and will be received by the Secretary for Public Works, in Sydney, and the Agent-General for New South Wales, in London, until December 30th, 1896, from persons willing to contract for the supply of 150,000 tons of steel rails and the necessary quantity of fish-plates, fish-bolts and spikes, manufactured in the Colony of New South Wales, out of iron ore and other necessary materials the natural product of, and with coal, coke or other fuel, smelted, gotten and raised within the said colony, upon the terms and conditions which can be seen at the offices of the Minister for Public Works, Sydney, or the Agent-General for New South Wales, London. J. H. YOUNG, Minister for Public Works.

THE ENGINEERING AND MINING JOURNAL. ADVERTISING RATES. (NON-FAREIL MEASUREMENT.) Table with columns for Lines, Inches, Regular Edition, One Month, Three Months, Six Months, Nine Months, Twelve Months. Includes SPECIAL POSITIONS section at the bottom.

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500-light Western Electric; one 540-light Edison, 30 K. W.;
one 550-light Mather, compound wound; one 600-light Western
Electric, compound wound; two 1,000-light Standard, multi-
polar, compound wound; one 950-light Mather, 25 K. W., com-
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to extend their trade to foreign countries is solicited.
Reference is made by permission to Dr. R. W. Ray-
mond, 13 Burling Slip, New York City; and other first-
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Particulars of above adventure were given in ENGI-
NEERING AND MINING JOURNAL of August 29th. Fif-
teen shares remaining of the three hundred into which
the pool is divided are now offered for subscription at
\$100 each. Each \$100 share will receive in case of suc-
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COLORADO SPRINGS, Colo., September 10th, 1896.
DIVIDEND NO. 9.
A dividend of ONE CENT PER SHARE (\$22,500) has
been declared, payable September 25th, 1896, to stock
holders of record September 18th, 1896.
The stock transfer books will be closed September
18th, 1896, at 3 o'clock p. m., and will be re-opened on
the morning of September 26th, 1896.
PERCY HAGERMAN,
Vice-President and Treasurer.

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mine, steel works or foundry, by a chemist of
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edge of metallurgy of iron and steel; neat, accurate
and reliable; accustomed to conduct work of laboratory
in first-class manner; good references. Address AC-
CULATE, ENGINEERING AND MINING JOURNAL.
No. 14,828, Oct. 17.

EXPERIENCED MAN ON DESIGN, CON-
struction, erection and repairs of coal-mine ma-
chinery and locomotives wants work. Address I. J. G.,
ENGINEERING AND MINING JOURNAL, No. 14,829, Oct. 17.

CONTRACTS OPEN.

Continued from Page 18.

PUMPING ENGINES—OFFICE OF THE DE-
partment of Public Works.—Sealed proposals will be
received by the city of Chicago until November 14th,
1896, for furnishing and erecting on the foundations to
be constructed at the proposed pumping station at the
southeast corner of Springfield avenue and Blooming-
dale road (Pacific Junction), in the city of Chicago,
three vertical condensing triple-expansion engines of a
capacity of twenty (20) million gals, per 24 hours each,
with a total lift of one hundred and fifty (150) ft., to-
gether with necessary boilers and all accessories and
appurtenances, arranged for a complete plant of the
best type, according to plans and specifications on file
in the office of the Department of Public Works of said
city.

Proposals must be made out upon blanks furnished
at said office, and be addressed to said department, in-
dorsed "Proposals for Pumping Engines, Pacific Junc-
tion Pumping Station," and be accompanied with \$25,
000 in money or a certified check for the same amount
on some responsible bank doing business in the city of
Chicago, and made payable to the order of the commis-
sioner of public works.

The commissioner of public works reserves the right
to reject any or all bids; due consideration will be
given to general merits of design, durability of con-
struction, economy of operation and maintenance,
facility of repair and proven performance and record
of similar works in actual service elsewhere.

No proposal will be considered unless the party offer-
ing it shall furnish evidence satisfactory to the com-
missioner of public works of his ability, and that he has
the necessary facilities, together with sufficient pecuni-
ary resources to fulfill the conditions of the contract
and specifications, provided such contract should be
awarded to him.

Companies or firms bidding will give the individual
names as well as the name of the firm with their ad-
dress. JOSEPH DOWNEY, Commissioner of Public
Works.

DREDGING.—U. S. Engineer Office, 106 Granby
street, Norfolk, Va.—Sealed proposals for dredging
western branch of Elizabeth River, Va., will be re-
ceived here until October 26th, 1896, and then pub-
licly opened. Information furnished on application.
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