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## EDITORIAL.

THE GEOLOGICAL SURVEY is to be congratulated upon the prompt publication of the progress report covering the supplementary geological investigations at Cripple Creek. The field work was done last summer and this preliminary report is dated November 3, so that no time was lost by Messrs. Waldemar Lindgren and F.L. Ransome. The earlier report of Cross and Penrose is modified only slightly by these recent investigations. A little finer differentiation of the petrography has been made, stronger emphasis is laid upon the intimate genetic relationship of the rocks, and, most important of all, it is demonstrated, by the aid of recent deep mining exploration, that the breccia in the southwestern portion of the district occupies a profound chasm in the fundamental rocks of the region, suggesting the great pit formed by explosive eruption. The detailed report will be awaited with interest, an interest heightened by the better condition of mining at Cripple Creek, where production is being maintained at a higher rate than there was reason to anticipate.

THE GOOD WILL which should exist between employers and employed—or, rather, we would say, between men all of whom are under employment, for the president and manages of a corporation are also in the service of the shareholders, just as the workmen are under the direction of the manager—was never better exemplified than at the pleasant ceremonies which took place on Christmas eve at the well-known North Star mines, of Grass Valley, California. Each workman got some of the product of the mine in the form of minted gold, the miners receiving \$10 and the boys \$5, the gift of the company. On the same occasion Mr. A. D. Foote, the superintendent, and his son, Mr. A. D. Foote, Jr., were presented with tokens of the esteem in which they are held by the workmen associated with them in the successful exploitation of a splendid mine. At the close a telegram was forwarded to Mr. James D. Hague, the president of the company, living in New York, to thank him and his co-directors for their kindness. There is not likely to be a

strike at the North Star at the present time, nor need walking delegates apply. One-half the trouble between employers and employed is due to sheer want of consideration on both sides. Man's inhumanity to man takes many forms, and is responsible for most of the brutality which leads to the feuds that disgrace what is called modern civilization. A little kindness is the lubricant that makes the machinery of administration move smoothly and silently.

NO METALLURGICAL paper of recent years has attracted more attention than that by Mr. James Gayley, an abstract of which appeared in a recent (Oct. 27, 1904) issue of this JOURNAL. General opinion in both theoretical and practical criticism, seems to accept his estimate of coke waste as being unnecessarily high; but there is variance of opinion as to the real cause. As told in another column, Le Chatelier would cut down the loss, from water in the blast air, to 5 per cent, or one quarter of what Mr. Gayley makes it; but the French authority concedes that the figure of coke-loss may be correct, though he would credit it to other causes. Certainly the humidity of the air will be well ventilated before interest in the subject subsides. Meanwhile it should be noted that the foreign critic has distinctly failed to score his point. From test-tube to tuyere is a long step. Mr. Gayley is talking from experience.

AS NOTICED in another column, a move-atize is on foot to improve and systematize the methods of commercial, and especially metallurgical, analysis. While it is always easier to propose than to execute, yet, in this case, the evidence of a want is abundant excuse for the attempt. It seems decidedly wise to use the National Bureau of Standards in the fulfilment of this purpose; but back of it all, it will be necessary to build up a strong public interest. A committee on lead was appointed several years ago in the West, but nothing has been heard from it; perhaps it did not have the support of the smelters. We would suggest that, in giving comparative reports, not only the maxima and minima be furnished, but also the true mean in each case. Surely well mixed samples can not vary two or three per cent in any ingredient. All who have had anything to do with the analysis of commercial products know something of

the odium incident to telling the trade the simple truth. Certainly the time has come for a bold, united and systematic movement looking to the improvement of standards all along the line, from copper to coffee, and from sugar to cement. Behind all the indifference and stupidity of the public is the business need of knowing the facts, quickly and exactly. It will take good organization and shrewd generalship to do this; but the American chemists have the leaders; let them have the followers.

AT THE MEETING of the Lake Carriers' Association, in Cleveland last week, no official action was taken on the question of labor unions; but it is understood that the general feeling of the members was in favor of asserting the "open shop"—or rather the "open boat"—principle on the lakes. In view of the present condition of affairs, and the closeness with which the employees of the lake vessels are unionized, this will involve a contest, which will surely come at the opening of navigation. It is understood that the executive committee, to which the matter was referred, is preparing to carry out the evident intention of the association.

THE FOLLOWING paragraph is worthy to appear in that funny column which the New York Sun publishes under the title of mining news: "The Mississippi valley is eminently fertile. The mineral kingdom produces in great abundance copper, iron, coal, lime, salt and lead, which in Missouri, Colorado, and Idaho appears inexhaustible; there are also rich lead-mines in Illinois and Wisconsin. California produces silver, copper and lead, and gold in large quantities." This is taken from page 625 of the 1902 edition of 'Whitaker's Almanac,' a reference book published in England and held in high esteem, and is intended to describe the mineral resources of the United States. The fertility of the Mississippi valley can pass unquestioned, but the rest of this pseudo-information is not worthy of further castigation.

THE RECENT appearance of three rather important monographs by the State Geological Surveys of Iowa, New Jersey and South Carolina, on the clays of those States respectively, indicates the interest which is now felt in the clay industries and the importance which attaches to them. The clay worker, not so long ago,

was a neglected factor in the mineral industry, and his work was left a good deal to chance and rule-of-thumb. Its importance, however, is now being realized, and the assistance that can be rendered to him by scientific work, is appreciated, both by the geologist and the worker himself. The substitution of other structural materials for the lumber formerly in almost universal use, has a great deal to do with this. Steel, stone in the States where it is abundant, brick, and cement are largely taking the place of wood, and over a large area of this country, where building stone is comparatively expensive, the clay products must be the principal reliance.

THE LAW OF the indestructibility and mutual convertibility of all forms of energy is the fundamental concept of thermo-dynamics, where it is divided into two statements, namely: The first law of thermo-dynamics, energy can neither be created nor destroyed, or the sum of the energy in the universe is a constant; the second law of thermo-dynamics, only a certain fraction of energy can be converted into work, depending on the difference in temperature (or potential) between the origin and destination of the energy. Strangely enough, the second law was developed before the first, namely, by the brilliant and lamented Sadi Carnot, in 1824; while the first law, though conjectured earlier, was not formulated till the 'forties, by the work of Joule, Meyer, Clausius and others, on the mechanical equivalent of heat. Every indicator diagram for a steam-cylinder, or condenser-chamber, is only a graphic analysis and proof of Carnot's great generalization of the thermo-dynamic cycle.

THE OPENING of the gravel deposits of Yuba county, in California, to the dredging industry has caused a great change in sentiment in that district. Yuba county, and especially the town of Marysville, was the center of the anti-débris agitation which sought to shut off all the different forms of gravel and hydraulic mining. Now, since the district surrounding Marysville has become the seat of a profitable dredging industry, opinion seems to have changed entirely, and the board of supervisors of the county has declined to give any further aid to the Anti-Débris Association.



The importance of this industry in California is rapidly increasing. We have frequently referred to the work in Yuba county, and at the present time it is being extended to Sutter county, where several large tracts have been purchased for dredging purposes; while similar work has been begun near Folsom, in Sacramento county, and along the American river. Prospecting is also going on in Butte county, and at other points.

#### Utilizing the Culm Piles.

In an address which was published in our columns last year, Mr. James Douglas characterized as one of the great "wastes in mining and metallurgy" our ordinary practice in making coke from coal, in which the by-products are totally lost. The most important of these is the gas, a considerable part of which could be utilized in generating electricity, so that a district like the Connellsville coke region might be made a center of production, from which power could be supplied to all the territory within the radius of practicable transmission.

An almost equal waste is found in the culm banks of the anthracite coal region. More than ten years ago the Anthracite Coal Waste Commission called attention to the need of husbanding our anthracite resources, and referred to the possibility of closer saving of coal and the use of the culm. To some extent the closer saving has been realized by the use of the smaller sizes of coal; but the culm bank remains an unsolved problem. Attempts to make briquettes from the coal dust have been made, but have not been commercially successful, the cost being too high to permit competition with coal.

Two other methods have been suggested, each having, apparently, prospects of success. The conversion of the culm into gas, for transmission by pipes to points where it could be used, was the earlier plan. This has never been tried on a large scale, chiefly, we believe, because its success might interfere with the established business of the anthracite companies, while no one else was ready to invest the money required. The second is the use of the culm as fuel to generate electric power. Near some of the larger cities in the region the culm piles have been used successfully to supply the local electric light and electric railroad plants, and there is a probability that similar work will be undertaken on a large scale.

As between gas and electricity, it is probable that the latter would now offer the greater advantages. In one way or the other we hope to see the solution of the problem, and the great saving in coal which will certainly result.

#### Mine Valuation.

On another page we reply to a correspondent in Mexico, who asks for an explanation of the use of annuity tables in the appraisal of mine shares, and we have taken the opportunity to publish Inwood's tables, which are used by investors in South African mines. To some of our readers, it will seem absurd to apply such methods to the cheerful gamble of a mining venture; and to these same readers, the vagaries of gentlemen from Arizona and prophets from Boston, are fit and proper adjuncts to an industry, the importance of which to us, on the other hand, can be gauged, not only in terms of money, but also, by the education and character of the profession which tries to serve it faithfully, despite the careless disregard of an ignorant public. To many speculators, the talk of amortization of capital, return of investment, life of mine, and other financial terms indicative of serious business, is only an irritation; and, when you speak to them of the necessity of a mine paying back the market valuation, plus interest on the investment, they grow weary. But it does not need a long lifetime to appreciate the fact that mining is slowly emerging, from the muddy shallows of spurious finance, to a dignified business; and, if our insistence on certain fundamental principles can contribute to that end, one of the purposes of this JOURNAL will be fulfilled. It is pitiful to notice how the daily press, in its comment on the Montreal & Boston imposture, appears to accept a low standard of morality as inherent in mining affairs, without so much as a side glance at disgraceful messes, such as that of the Shipbuilding Company, and other industrial undertakings whose sponsors sit in high places.

Those who buy shares to sell them at a higher price, usually have little regard for niceties of valuation, and consider, properly enough, that market conditions are a more important factor than any academic ratiocinations; but, even to these gentlemen who dabble on the dangerous margin of the financial rapids, it will be found well to have an idea of that which

is the fundamental basis of their speculations. Sooner or later, they must face the facts; every speculator eventually fails to find one more reckless than himself. Ore reserves, and profits derived from them, are the essence of successful mining enterprise; without them, the mine is only a hole in the ground. Dividends indicate the surplus of a moment; they are no criterion of future returns, unless these are insured by accurately measured reserves of ore. Low costs are a symptom of healthy economy, but they do not guarantee profits; they simply prove that the minus quantity to be deducted from the value of the production is relatively small. Good management does not make a mine; it is only an aid. We sympathize with the unfortunate Britisher who, after several experiences with poor mines and good managers, is said to have exclaimed that in future he would invest in mines that could stand bad management. Properly ascertained resources in the form of orebodies, thoroughly sampled and measured, are the only assurance of the long life of a mining enterprise; and, without such assurance, it is not an investment. But this does not belittle the worthiness of sensible speculation, which has been, and ever will be, the quickest way to make money. We simply desire to emphasize the essentials of an 'investment,' which is the attractive term too generally applied to schemes of an essentially speculative character. Pay your money and take your choice; but, for the sake of sound mining, let us make distinctions which are essential.

#### The German Coal Miners' Strike.

The strike of the German coal miners, which began this week, appears to be the most important movement of the kind since the great strike in the Nord and the Pas-de-Calais mines in France five years ago. The cable despatches report that over 70,000 miners are out, chiefly in the Rhenish-Westphalian district, the most important in Germany. The movement is, apparently, a direct result of the last meeting of the International Miners' Congress, since the demands formulated by the men are in accordance with the resolutions adopted at that Congress. They are, in effect, that all miners shall have for 1905 a nine-hour day, this to include the time occupied in entering and leaving the mine; while at the beginning of 1906, the day is to be reduced to eight

and a half hours, the object being to enforce, after a further lapse of time, the eight-hour day. In France these conditions will apparently be established by the project of law, which is now under consideration in the Chamber of Deputies, and which will probably be adopted; so that in that country no strike is contemplated.

The syndicate of German mine-owners has resolved not to accede to the demands of the miners in any event, and the present outlook is for a long suspension of work. Meantime the situation appears serious, as there are no great reserves of fuel on hand anywhere. Already the Prussian state railroad management has ordered the seizure of all coal in transit, which is to be retained for the use of the railroads. There is no doubt also that the government will apply strong measures of police repression, and in Germany this means a good deal.

### Market Conditions.

Jan. 19.

The metal markets are getting over the quiet incident to the opening of the year. Copper is showing a fair business with domestic buyers, and an improvement in foreign purchasing. China is again in the market for considerable quantities.

Tin is in good demand, and spot is scarce. In lead there has been the usual trade. About the same thing can be said of spelter, but it is, perhaps, slightly easier. In the Joplin ore market last week there was considerable competition, and the record price—\$58 per ton—was paid for one lot of ore.

Silver has been quiet and a little stronger. Business with the East continues fair.

The iron and steel markets show comparatively little change from last week. New orders are still rather slow, but the mills are busy, and specifications on contracts continue to be pressed, showing that manufacturers are in need of material. The buying of lake ores has begun, and prices are on a range of about 50 cents above those of last season.

The western coal markets are rather dull, in spite of cold weather. The local markets, both for steam and domestic coal, are depressed by an oversupply.

The seaboard bituminous coal trade is in good condition and shows little change from last week. The anthracite trade also shows little change and continues to be supported by cold weather.

### Metallics.

Culled from all sources. Our readers are invited to assist this department by sending similar material.

The name *spodumene* is from the Greek *spodos*, ashes, from the dull whitish color of most of the altered crystals. In Europe the mineral is also frequently called triphane.

The progressive engineer never takes anything for granted. The men who doubt the most are the readiest to discover a new fact, or discern a flaw in present methods.

The progress of industry may be measured by four powers: (1) Man power; (2) animal power; (3) water power; (4) steam power. The ideal power of to-day is water power conveyed to the point of use by electricity.

Turquoise, accidentally discovered in the Santa Rosa district, near the town of Bonanza, in Zacatecas, Mexico, occurs in veins and in nodules, is rich in color and fine in quality. The mine which was worked for silver is now yielding turquoise principally.

Suction dredges may be used for removing sand and loamy soil in almost any situation; but the presence of boulders requires other forms, such as that of the scoop or bucket.

By two inevitable processes, Nature has decreed that the human body is mortal; one is the tendency to abnormal ossification of the softer tissues, as arteries and veins, by calcium phosphite; the other is the development and retention of insoluble and poisonous uric acid derivatives. It is interesting to note that this process of body ossification is only an extension of the general petrification tendency of geology.

A new source of arsenic poisoning is announced in the impurities in zinc and sulphuric acid, employed to develop hydrogen, as used by lead burners.

No satisfactory separation of nickel and cobalt electrolytically has yet been devised for commercial work, notwithstanding some published statements to the contrary. There is a method for precipitating cobalt by the current, provided the solution contains phosphates and free phosphoric acid; though the results are high, they are more satisfactory than those of the gravimetric methods of pure chemistry. The phosphate method does not work well with nickel. These statements are on the authority of F. M. Perkins and W. C. Prebble in a recent paper before the Faraday Society of London.

### Orthography in Geography.

If a prize-winner in an old-fashioned spelling bee should try his skill in formulating properly the geographic names that are printed in a single volume of this JOURNAL, he would probably have to admit that the nomenclature of mining regions was a strain upon his powers. He might prove equal to remembering that a British Columbia mine was spelled Cariboo, while California and Colorado each boast of mines spelled Caribou; but he would doubtless fall down when it came to distinguishing the intricacies of Mesabi range, Mesaba mine and Missabe mountain.

While Pittsburg is as good as Pittsburgh in most cases, there are certain incorporated companies that use the 'h' spelling and are not properly named by the shorter form. It is easy to remember that Burma is now generally preferred to Burmah; but that Panjab is the official spelling for what used to be written Punjab or Punjaub, is apt to pass notice. Then there is the Kalgoorlie mining district containing the famous Kalgurli mine, which must be differentiated in spelling; as also the well known Le Roi mines of British Columbia and the Leroy mine of Idaho. The El Dorado mines of both Arizona and California are spelled as two words, but the Colorado mine is Eldorado.

If the prize speller should be preparing copy for the printer, he would run upon another class of troubles, finding that usually Moctezuma was rendered Montezuma, while the Mansfeld district of Germany was modernized wrongly to Mansfield.

It is of course the lesser known names that cause the most trouble. One may be pardoned for forgetting that the Balaclava mine in New South Wales is not spelled the same as the more familiar Balaklava, where the Russians and English fought in 1854. And if Walaroi and Wallarah at the Antipodes become mixed, few in America are likely to notice it.

Temiskaming is too familiar to Canadians to permit of a blunder, though it is a jumble of letters; but surely Yuljickar, Tallawadja, Jembaicumbene and Sahuayan are trying to the orthographical sense.

Happily there are cases in which one cannot go wrong. The little town of Oiootorsk, or Olioutorsk, Oliutorsk, Olutorsk, Olutorsky, Olutorskoi, etc., situated on the river and bay of the same name (or names, take your choice), in Kamchatka, is correctly and authoritatively spelled in each of these six forms; so we can hardly err in this case.

The crack speller also has a hard time of it when he dives into mineralogy; but that is too large a subject for the present writing.

\* The first mines were fields: hence the terms coalfield, goldfield, oilfield, and the like.



### Discussion.

Readers are invited to use this department for the discussion of questions arising in technical practice or suggestions by articles appearing in the columns of THE ENGINEERING AND MINING JOURNAL.

#### THE EFFICIENCY OF THE SURVEY.

##### The Editor:

Sir—The main contentions of your recent leader on the efficiency of the Survey will perhaps find support from many Survey geologists. Others, like myself, may recognize the possibility that administering such undertakings as "wood, water and arithmetic" rather helps than hinders the progress of the Geological Survey in its law-intended "round up" of geologic fact and principle. "Unto him who hath shall be given" has been fulfilled by the record of the Survey, and though expenditures for geologic work in proportion to the total disbursements of the bureau are now less than ever before, the actual money devoted to geology has been a larger sum each year since 1892. Discussion of this question is not, however, my present purpose.

I think the statements of your closing paragraph are in the main incorrect, and the inferences to be drawn from them, therefore, unwarranted. As a whole, this paragraph seems to me to do a great injustice to the majority of Survey geologists. From conversation with certain men who are rated among the ablest workers remaining, I know that they think with me that you are striking very near our self-respect. I for one would not tolerate the conditions which you aver, if convinced of their actuality. Justifying myself in remaining here and seeking a field for scientific work within my ability, I maintain that the picture you have painted is false, both in detail and in effect.

To specify: (1) The real investigator has not been reduced to the ranks, nor is he subordinated to executive talent. True, we are required to make monthly reports summarizing activities and results; some of us may have been refused publication of certain work which a committee of our peers have regarded as not up to the desired standard as regards value or manner of presentation; but these and other necessities of concerted action are to be suffered for the attainment of the best results.

If the military simile is carried out consistently, the ranks have always been composed of geologists. Consequently no geologist can be reduced to the ranks. Again, our clerks and messengers are civilians. They are valuable and necessary, but the fight against the unknown is not theirs; the acquisition of basic information and its purveyance to benefit utilitarians is not their *raison d'être*. If executive talent is better paid than research, in each instance an investigator has been called upon to abandon part or all of his scientific work, a sacrifice which should be compensated.

(2) The Survey geologist is not re-

stricted in any important respects as regards independent thought, and in the exercise of his office he certainly has perfect freedom of action. If he is expected to serve either science or mammon, he at least has free choice.

It has been said that the strength of the American army in action rests largely in the fact that each soldier is a man, an individual ready for, and capable of, initiative. So in the Survey, as now organized and administered, each ranksman, if able and ready, stands, or may stand, free to think, and with adequate opportunity for his highest activities. Efficiency is the test to be met by each worker; production, the determinant of his mead of honor and relative remuneration. Mistakes of judgment in rating individuals may occur, but my observation goes to show that in the official estimation of Survey geologists, the present régime is fully responsive to dividends paid in the form of finished work.

(3) Within my remembrance, which covers the doings of the Survey for nine years, only two geologists on annual salaries have resigned. Those who give up regular positions for *per diem* work are men who wish to enjoy the privileges offered by the Survey, and at the same time have entire control of their time. In some instances the effect of the *per diem* plan has been that, to certain men, the Survey makes the offer to take their services whenever nothing more remunerative offers.

(4) "Bread and butter dependency" is a text indeed; but I forbear, because the readers of THE ENGINEERING AND MINING JOURNAL might not appreciate an exposition of my private philosophy. I may say, however, that it is similar to that of many other scientific men, who manage to remain cheerful, though dependent, ambitious, though enslaved.

(5) No one needs more effective inspiration than the realization that he must justify his occupancy of a particular niche or vacate it. This inspiration the government geologist has at present more than in the past.

(6) Of credit and honor I have already stated my opinion, that both are forthcoming to the efficient worker under the present administration of the Survey.

(7) Remuneration. On the Survey, as elsewhere, the price of men is influenced by supply and demand. I can assure you that there is at present no lack of young men desirous of assuming the burdens of official geologic work. They come to the Survey either because they cannot earn more outside, or because the difference in wage is compensated by the opportunity of doing the work which interests them most.

The foregoing represents nothing more than my personal belief; but I hope my remarks may lead to further inquiry before public opinion renders a verdict upon

the efficiency of the geologic branch of the Survey.

ARTHUR C. SPENCER.

Washington, Jan. 10, 1905.

#### DRY-AIR BLAST IN THE MANUFACTURE OF IRON.

##### The Editor:

Sir—I have been much interested in the proposal of Mr. James Gayley<sup>1</sup> to produce a dry blast by refrigeration of the air; and in this connection I would submit a translation of a critical note by Henri Le Chatelier<sup>2</sup>.

"For some weeks the foreign technical journals have had numerous references to Mr. Gayley's discovery relative to the use of dry air in blast furnaces. Messrs. Alfred Picard and Heurteau discussed this subject at the last meeting of l'Académie des Sciences. By the use of air, dried by cooling to 0° C., the consumption of coke in the blast furnace is lowered 20 per cent. If this fact should be verified, it would prove a genuine economic revolution for the iron industry. It is true that many engineers are indifferent to exactness in stating fact. It may be interesting to discuss the possibility from the scientific standpoint.

"The economy announced is ascribed to the fact that water vapor (which traverses the blast furnace) occasions wasteful expense of coke, by transforming itself into a mixture of hydrogen and carbon monoxide, which escapes at the throat of the furnace. Moreover, this reaction absorbs a small quantity of heat which must be compensated by the consumption of an additional quantity of coke. The loss, and the resulting economy which ought to be realized by relieving the air of a part of its humidity, can be rigorously calculated. In the experiment in question, the amount of water vapor condensed in the refrigeration chamber is about ten grams per cubic meter of air. The saving effected, at the maximum, would be only about 5 per cent, or about one-fourth of the figure announced.

"It may be affirmed then, with certainty, that, though the saving announced may be correct, nevertheless the cause to which it is attributed is not the true one. It often happens that inventors may arrive at interesting results, though they may be actuated by an indefinite idea. This would appear to be the real case here.

"Let us remember that the quantity of coke consumed in a blast furnace is not measured solely by the weight of the smelt produced. According to the quality desired, the purity, and particularly the greatest tenor of sulphur admissible for the ultimate use of the metal, we regulate the heat respectively. Thus it is possible with the same ore to vary the consumption of coke per ton in smelting,

<sup>1</sup> This JOURNAL, October 27, 1904.

<sup>2</sup> *Moniteur Industriel*, December 17, 1904.

from 800 to 1,200 kg., according as we make up the charge from the preference of quality or quantity. If the use of dry air gives a purer smelting, and less sulphurous, it will be possible to proceed in a colder way, without falling below the quality intended. It should be possible, with moist air, to smelt the same weight of combustible; but it would result in a melt too impure and impracticable. On this hypothesis, economy finds itself justified; but it will be only as an indirect consequence of the suppression of the water vapor. One may not conclude, as the author did, that the same result ought to be obtained in some other works (as of bessemer steel) as in copper work, where the conditions are entirely different. To justify this interpretation, it is necessary now to show the rôle that moisture will play in the more or less complete desulphurization of the metal. The sulphur comes chiefly from coke; before the tuyere it burns (at same time as carbon), forming sulphur di-oxide. This gas in presence of the oxide of carbon tends to fix itself in the lime, forming some calcium sulphide, which passes into the slag. The sulphurous gases can thus be completely absorbed before arriving in contact with metal not yet smelted (which is found in the highest part of the blast furnace). The melted metal travels across the hottest regions too rapidly to absorb the small quantity of sulphurous gas, which it encounters in the vicinity of the tuyeres. In the contrary case, where the gas is damp or simply hydrogenous, the absorption of sulphur cannot be complete on account of the phenomenon of equilibrium established. There remains in the gaseous mass a proportion of hydrogen sulphide, and the larger in proportion as this mass is itself richer in hydrogen compounds (that is to say, substantially moister). These gases rise in the blast furnace, and end by coming in contact with the porous sponge of iron by which they are absorbed.

"There is here a point which it is easy to submit to the test of experience. I made the following experiment: Some calcium sulphide was heated at a temperature of 600° in a current of carbon monoxide; the first time dry, the second moist, and the third mixed with 10 per cent of hydrogen. To show volatilization of the sulphur compounds, a ribbon of silver was placed in a heated tube, following a column of the calcium sulphide, then followed a bulb with a solution of silver nitrate. With the dry gas, neither the ribbon nor the solution were colored black; with the moist gas, the ribbon was not colored black, but the solution began to color, and in an hour a clean, black precipitate of silver sulphide was obtained. When the gas was mixed with 10 per cent of hydrogen, both the ribbon of silver and the solution were colored black immediately. The facts seem to justify us in

thinking that the results announced by Mr. Gayley may be correct, but that they may be due to causes entirely different from those to which he has attributed them."

This note from Professor Le Chatelier is interesting; but it will need more than the production of a little hydrogen sulphide in a test tube to meet the facts derived from Mr. Gayley's blast furnace. Our French critic rightly said that one cannot certainly reason from the conditions of the copper furnace to those of the blast furnace (with its enormously higher temperature); much less can one reason from laboratory to furnace, without the intervening experience. The only excuse for trenching upon your space is the prominence of the French authority, whom I have quoted.

ALCHEMIST.

Boston, Jan. 3, 1905.

#### CHLORINATION VS. CYANIDATION.

##### The Editor:

Sir—In your issue of Dec. 29 Mr. Argall criticizes, at some length, my article on the 'New Chlorination' which appeared in the issue of Dec. 1. He assumes that what is common knowledge in chlorination, and what is disclosed in the Cassel and Greenwood patents, are all that can be known on this interesting subject, and that further advancement is impossible. If this were so, the outlook would not be promising. However, much remains to be disclosed on electro-chlorination, and the possibilities have not by any means been exhausted. The cyanide process was declared a failure by many of the early workers, who thought the limitation of knowledge had been reached by their experience, until McArthur and Forest disclosed a simple trick they had evidently overlooked.

Mr. Argall very ingeniously, and very unfairly, while not making a direct statement to that effect, gives the impression that the small experimental plant at Colorado Springs designed by me, was a large working plant and a commercial failure. It would be quite as logical to argue that the cyanide process is a failure, because the preliminary bottle-tests are not continued indefinitely, and are not a commercial success. As Mr. Argall suggests, this plant was not closed down as a matter of sentiment; it was closed down because I advised it. The plant, instead of being erected at a 'very substantial sum,' was a small experimental plant of three cells which were used in connection with one of the barrels when not otherwise in use. The plant, when it was shut down, had fulfilled the functions for which it was designed; and further operation would have been a useless expense. As an experimental plant, it was a qualified success. It did absolutely everything, from a technical view, that was claimed for it;

and the matter of ultimately installing a working plant for the mill, has not, so far as I know, been abandoned. Furthermore, contrary to Mr. Argall's views, I predict that within two years every chlorination plant, treating Cripple Creek ore, will be equipped with an electrolytic plant to generate its own chlorine. Already, in at least one more of the large mills, they are preparing to generate their own chlorine by electrolysis.

In citing the cost (of reduction) of 41c. per ton to 200 mesh at the Oroya Brownhill, the inference is that it can be done at Cripple Creek. Mr. Argall carefully avoids making the direct statement. If such a thing were possible at Cripple Creek, it would indicate that we, in Colorado, who pride ourselves on being abreast of the times, have much to learn from our professional brethren of the antipodes. If the Oroya Brownhill ore can be crushed to 200 mesh, and filter-pressed for 83.5c.; and, if the inference is that it can be done in Colorado, then it would surely indicate that Mr. Argall's cyanide practice is sadly in need of revision. According to his own statement (which I dispute), he could treat ore in his hypothetical mill for \$2.20 per ton; this leaves a difference of \$1.365 in favor of the Australian method. The ridicule may be "on the person who rashly ventures to write on matters regarding which he is not accurately informed," but it is vastly more on the man who advocates methods so far obsolete as to permit a difference of \$1.365 per ton, on essentially the same process. In citing the Oroya Brownhill figures against me, as applicable to Cripple Creek, he inadvertently admits the contention, made by Mr. James and Mr. Hoover some time ago on the Australian practice.

I am informed that fine-grinding machines, such as the arrastra, have been used without screens from time immemorial. This is admitted; but it never occurred to me to use an arrastra in the reduction of several hundred tons of ore per day for a chemical process. The idea certainly is novel. Prof. Christy has demonstrated that the iron, in such fine grinding with the arrastra, was detrimental to cyanide.

The matter of the relative expense of chlorination, taking the practice in vogue, may be disposed of in a very simple way. The cost of sampling is the same by either process; whatever the cost of crushing, it will certainly be less for 12- than for 30-mesh; roasting will be about the same for either process, with the balance in favor of chlorination; the cost for cyanide is less than for chlorine, if chemicals are used; and more, if electrolytic chlorine is employed. Mr. Argall is familiar with the cyanide practice on custom ores of Cripple Creek; I would suggest that he give an itemized cost of cyanidation, similar to that given by me for chlorination.



Reference is made to some tests on chlorination dumps which "give promise of saving a dollar per ton profit." Did Mr. Argall ever try the experiment of chlorinating cyanide-tailing? If he should, he would probably find the same thing. This property of saving additional values, by an extra treatment, is not peculiar to cyanide. Some time ago I made exhaustive tests on some Cripple Creek tailing. My results agreed fairly well with Mr. Argall's experience. Comparative tests, with dilute chlorine solutions, gave fully as good extraction, in about half the time. I recommend the use of chlorine in preference to cyanide, because the dilute gold-chloride solutions, from the leaching vats, can be used as charge water for the barrels, thereby avoiding entirely the extra precipitation, and no preliminary treatment of the acid tailing being necessary. Neither process was adopted, because the margin of profit was not large enough to offer an inducement. The re-treatment of chlorination tailing, by cyanide, has failed wherever it has been attempted. At the Atlas mill in Boulder county, it was tried and failed. The attempts in California have been numerous, and always ended in failure.

Mr. Davis, in his criticism, does not offer a single fact or figure to substantiate his views. They are entirely negative; and, were it not for his "amusement at my views when it became his duty to dismantle an electro-chlorination plant and refit the same for cyanide," a reply would be unnecessary. The mere substitution of one process for another does not mean anything, unless it can be shown that one was a failure, and the other a success. If this cannot be shown, the inference is that the man who made the change, made a mistake.

I am familiar with the Boulder county plant referred to. It was equipped as an electro-chlorination mill with open-vat leaching, as in the cyanide process. Several hundred tons of dump material, averaging about \$4.50, were treated successfully, except that the old type furnace, previously installed, could not be kept in continuous operation, and hence the result was very poor roasting. It was decided to put in a new furnace; and, while these repairs were going on, the technical management at the mill changed. After the repairs were completed, the new management treated 75 tons of ore (in a 50-ton mill), condemned the process, and substituted cyanide for it. Now the interesting feature of this transaction is, that, although these changes were made over a year ago, only 238 tons of ore were treated. The mill was shut down soon after, and not a pound of ore has been treated since. The total assay value of the 238 tons of ore treated by cyanide was \$1,917.69; the actual bullion recovery was \$1,498.53; this shows a bullion extraction of 78.1 per cent. One of the items not

included in the bullion stated above, is the gold in the unprecipitated solution, amounting to \$25.13. The time of treatment was two weeks. Now, taking Mr. Davis' figures, in his criticism of me that "there is no difficulty in precipitating to 0.005 oz. gold per ton of solution," it follows that he had 251.3 tons of solution, and circulated it through the 238 tons of ore for two weeks—an expense item compared with which the revolving of a chlorination barrel, or the power required to generate the necessary amount of chlorine by electrolysis for the same quantity of ore, fades into insignificance.

I do not quote these figures as against the cyanide process. Our own cyanide tests, made at the time the mill was contemplated, showed results on much (not all) of the ore, fully as good as those made by Mr. Davis. The electro-chlorination process was adopted, not because cyanide was not considered a suitable solvent, but because the other was considered cheaper and better. Mr. Davis has not yet done anything to change my views. With only 238 tons of ore treated, with at least three cyanide mills closed down within a radius of one and one-half miles from the mill referred to; with not a single cyanide success in the district, he has yet to demonstrate that the changing of the process was not an unwarranted expenditure of the company's money. Surely the treatment of 75 tons by one process, and 238 tons by the other, would not indicate success or failure, by either process.

Mr. Davis also states that "the electrolytic chlorination process, though preceded by roasting, had failed to extract the gold from the ore, which was a simple telluride." This, of course, is mere nonsense. Chlorine is chlorine, whether generated from salt by electrolysis, or chemically from other compounds. Previous to the erection of this mill, the ore was sent to the chlorination mill in Boulder, where it was successfully treated. The reason why the chlorine did not extract the gold, was evidently in the roasting. No furnace, on being first put into commission, does satisfactory work. If the first 75 tons had been roasted as well as the 238 tons treated by cyanide (from 0.95 per cent to 0.10 per cent), good results would certainly have followed.

Mr. Davis finds fault with my estimate of 15c. as the cost of producing electrolytic chlorine per ton of ore; but he very cautiously refrains from showing wherein it is wrong. The estimate was intended only as a close approximation, and, as such, is correct. He also accuses me of overlooking the difference between molecular and nascent chlorine. In the chlorination of ores there is no difference. A few bottle-tests will show this. Even if nascent chlorine had a greater affinity for gold than molecular chlorine, it would have a greater affinity for the base elements also, and the sum total, in any

process where the time is appreciable, would be the same.

WILLIAM E. GREENAWALT.

Denver, Colorado, Jan. 2, 1905.

#### The Editor:

Sir—I have followed with much interest the discussion between Mr. Argall and Mr. Greenawalt. In Mr. Argall's last letter he makes a statement which is misleading, and unjust to Mr. Greenawalt. In referring to the electro-chlorination plant designed by him, the inference is that it was a working plant and closed down on account of some inherent defect of the process. Nothing could be farther from the truth. I had charge of this plant from its construction to the time it was shut down. It was a small experimental plant of three cells. Technically it was a success, commercially it was not expected to be. The most serious defects consisted in imperfect apparatus, which, however, can not logically be attributed to any defect of the process. For example, the temporary storage tank which was placed in the barrel room could not be kept tight on account of a defective cover, so that the leakage of chlorine gas at times made the barrel room unbearable. This, of course, was not a defect in the process. There would be no difficulty in making a tight tank, and in a working plant it would be placed out of doors. There was no difficulty whatsoever in getting strong solutions. The excess was at times so great, after treating the ore with the same amount of solution as the water charged into the other barrels, that much hydrogen sulphide was consumed before precipitation could be effected. The cells worked at from 4.5 to 5 volts.

J. W. GIBBS.

Denver, Colo., Jan. 9, 1905.

#### A Warning.

A person presenting a printed card as "George Virchow, Pueblo, Colo., Mining Eng. and Met., Colo. Fuel and Iron Co.,"—which card is endorsed, with a pen, "At request of Dr. R. W. Raymond, Sec. A. I. of Min. Eng."—has asked, and in some instances received, aid from members of the Institute, on the strength of my supposed recommendation. I do not know him; did not write or authorize the endorsement above quoted; have never recommended persons in that way; and hereby give notice that the presentation of such a card, or the use of my name to obtain immediate aid without inquiry made of me, should be considered as presumptive evidence of fraud.

Another person (or perhaps the same) is reported to me as operating in precisely the same manner, under the name of Theodore Kant. The foregoing observations apply equally to this and all similar cases.

R. W. RAYMOND,

Secretary, American Institute of Mining Engineers.

New York, Jan. 18, 1905.

**Mining Stocks.**

(Full quotations on pages 150 and 152.)

**New York.** Jan. 18.

Though the mining stock market appears quiet, quotations are hardening, partly as a result of the strength in the metal markets. In the copper section Amalgamated, although reporting moderate sales, advanced from \$75.50 to \$77.25, and Anaconda from \$27.875 to \$28.1875. Greene Consolidated, showing a copper production of over 6,000,000 lb. in November, was strong, selling at \$26.25@ \$28.50. Tennessee was quiet at \$33.50@ \$34.875.

Horn Silver, of Utah, re-appeared at \$1.50, but sales are limited, as it is expected that the revenue will be materially increased now that the zinc concentrate is being successfully treated and sold.

Homestake, of South Dakota, is in a better position, as the mine is now free from debt and accumulating a surplus, suggesting the payment of 50c. in monthly dividends shortly. The January dividend was 25c. per share. In the six months from June to November, 1904, there were treated 687,762 tons of ore, having a total value of \$2,637,852, or an average of \$3.84 per ton. Net earnings during this period, after paying operating expenses, were \$839,733; dividends, \$327,600, leaving a balance of profit of \$493,000.

A sale of Quicksilver common is noted at \$1.75. The Comstock shares did the usual small business.

After declaring dividends at the rate of 7% annually for nearly four years, the Monongahela River Consolidated Coal & Coke Co. has reduced the rate to 1.54% on the \$10,000,000 preferred stock. The report for 1904 is given in another column. The Pittsburg Coal Co., the railroad coal combination, owns \$2,500,000 of Monongahela preferred stock, upon which the annual dividend yield will be cut from \$175,000 to \$38,500.

**Boston.** Jan. 17.

A much better tone is manifest in the local mining market, and many stocks record good advances during the week. Michigan, Greene Consolidated and Daly-West have been pronounced features, but the most significant fact is that the better grade of stocks—such as Calumet & Hecla, Tamarack, Wolverine, and Osceola—are per to the ton. Greene Consolidated has The activity has been in the Lake stocks, while the Utah properties have been neglected. On what was termed as good buying, and on large dealings Michigan rose \$4.75 to \$14.87½, but subsequently settled to \$13.50. From all accounts, this property is likely to be heard from in time. During December the rock ran 23 lb. copper to the ton. Greene Consolidated has been in good demand also, on the monthly report of Col. Greene, and is up \$2.25 to \$28. Daly-West is up \$5 for the week to \$19. No especial reason is given for this, unless it is the fact that the annual meeting occurs next month, and the buying may be to secure the present management in its place. Proxies are being solicited, and it is likely that a Boston gentleman may go on the board.

There was a report that Calumet & Hecla was out of the market with copper, which gives an added impetus to the situation. All that is lacking to make a buoyant active market is the public. Calumet is up \$45 to \$600; Tamarack \$13 to \$134; Quincy \$8 to \$118; Wolverine \$2 to \$107; and Osceola, \$3.75 to \$97.25. Tecumseh spurted from \$2.50 to \$3.75 on

active trading for this stock, which is seldom dealt in. Bingham closes the same as last week, at \$33.25, but Utah is up \$1.25 to \$43.25, and United States is the same at \$23.75. Isle Royale, spurted \$2.75 to \$28.75, and held all but fraction. Alouez has been firm from \$20.75 to \$21.75. Atlantic moved up \$18.25 and Adventure to \$7.87½. Centennial spurted to \$26, but fell back to \$24.50, and Mohawk rose from \$52 to \$54.50. Mass became active at one time and touched \$11.75. Considerable Shannon was offered on the announcement of a flood in that district, but the price was not affected much; the close was \$8.87½. It is understood in this city that Adolph Lewisohn will go in as a director of the Greene Consolidated Copper Co. The United States Mining Co. is expected to declare another 50c. dividend this month. The Bingham Consolidated will soon announce a dividend at the rate of \$2 per annum. The first payment will likely be 50c. quarterly, about April 1. The Granby mine's December net earnings amounted to \$65,000, from the treatment of about 1,800 tons of ore per day.

**Colorado Springs.** Jan 13.

The mining stock market has been active during the week and prices have held firmly, with advances in some.

El Paso has been the favorite of the week, advancing from \$1.23½ to \$1.43, with considerable selling at these prices. This stock has advanced steadily for many months, being about double what it sold for only a few months past. Findley has also been on the advance for some months, advancing from about 20 to 40c. Vindicator has declared its regular quarterly dividend of 3c., making a total that this company has paid of \$1,225,000.

Four of the five Portland directors have issued a statement in which they set forth the condition of the property, also saying that at the time of the Independence explosion they considered it to the interest of the company to take the management of the mine out of the hands of President Burns, and since that time it has been under their management.

**Salt Lake City.** Jan. 14.

The past week has been one of stagnation. Wabash fluctuated considerably, selling as low as 96c. a share and as high as \$2.25. The management has increased the working force at the mine and the installation of a large air-compressor plant will be started in the near future; the company is not giving out information to the public, but a vigorous development campaign is being prosecuted. Daly-West received very little call during the week, but the stock stiffened toward the close; it is not believed here that the quarterly dividend will exceed 60c. per share. The Mammoth directors did not meet this month, and the dividend was passed. The company has paid \$20,000 monthly for some time. Good reports from the development campaign being carried on at the Daly-Judge mine at Park City continue to come in, and holders of the stock have refused to sell at \$6.02½. However, one small block was brought out at \$6 flat. Butler-Liberal is shipping again and the stock has stiffened; sales were not over 5,600 shares. The heaviest trading was done in New York Bonanza, which has fluctuated from 40½ up to 50c. Tetra was a seller around 19c. May Day has weakened again. Announcement has been made that the United States Mining Co. will post a dividend of 50c. a share next month.

**San Francisco.** Jan. 12.

The market for the Comstocks was quieter this week. At first prices were fairly well maintained, but after a time some weakness was manifest, and there were several declines. The Tonopah stocks on the old exchange are receiving a good deal more attention. Some Comstock quotations noted are as follows: Ophir, \$6.75@ \$7; Mexican, \$2.10@ \$2.15; Consolidated California & Virginia, \$1.85; Hale and Norcross, \$1.50; Best & Belcher, \$1.25; Sierra Nevada, 57c.; Chollar, 35c.; Potosi, 24c. per share.

On the San Francisco & Tonopah exchange business was quite active, and sales were liberal. Some quotations noted are: Montana Tonopah, \$2.10; Tonopah Belmont, 73c.; Jumbo, 70c.; Original Bullfrog, 25c. per share.

On the California exchange business in oil shares continues quiet. Sterling sold at \$2; Oil City, 70c.; Independence, 30c.; Junction, 20c. The principal dealings were in Oil City and Independence.

**Coal Trade Review.****NEW YORK, Jan. 18.****ANTHRACITE.**

The trade in hard coal remains without special features. The long stretch of clear cold weather has been appreciated by the local dealers, since they have been able to meet the increased demand for domestic sizes with ease and promptness. It has, however, delayed the unloading of cars at way points, to the hindrance of through traffic.

Steam sizes remain at the old level; \$3 for pea; \$2.25@ \$2.50 for buckwheat; \$1.45@ \$1.50 for rice, and \$1.30@ \$1.35 for barley, at New York harbor points. Domestic sizes are \$4.75 for lump, \$5 for stove, egg and chestnut, New York harbor delivery.

The following is a statement of anthracite shipments by months:

	1903.	1904.
January.....	5,964,950	4,134,245
February.....	5,070,608	4,326,269
March.....	5,211,548	4,375,033
April.....	5,044,990	5,407,786
May.....	5,156,449	5,285,079
June.....	5,436,497	5,728,795
July.....	5,377,495	4,623,227
August.....	5,169,402	4,331,854
September.....	4,654,454	3,967,600
October.....	3,925,642	5,131,542
November.....	4,091,147	5,124,068
December.....	4,259,748	5,063,144

Total..... 59,362,930 57,498,642

The decrease in shipments for 1904 was 1,864,288 tons. The last three months of the year show a decided increase over the corresponding months of 1903. The total shipments during the strike year, 1902, amounted to only 31,210,911 tons; for 1901 they were 53,568,601 tons. The abnormal activity of 1903 was an indirect effect of the same causes that so reduced the output of 1902, so that the falling off in 1904 is more apparent than real.

It must be remembered that the above figures do not cover the coal used at the mines, or sold to local trade; nor that supplied to the locomotives of the shipping railroads.

**BITUMINOUS.**

The Atlantic seaboard soft coal trade is quieter than it was. During the last week a comparatively large quantity of coal arrived at the tidewater shipping ports. This has now been shipped, and the congestion is relieved to a great extent, if not entirely. As a result of this, prices dropped to about normal figures, ordinary steam grades being sold at \$2.50



@\$2.55, f. o. b. New York shipping points, with better grades offering at \$2.75 upwards.

Last week's spurt of activity on the part of the railroads seems to have exhausted them to a considerable extent, as bad transportation and a poor car supply have been reported from many quarters this week. If this continues for a few days longer, it will affect the market next week, putting prices up more or less on current business. Little is said about new business on the new contract season; producers are waiting to hear the outcome of the Indianapolis convention, and to learn what propositions the main line railroads will make in regard to through charges for the coming year.

Trade in the far East is taking all the coal that can be spared to that region. The shortage of water for motive power throughout this district, during the last part of the year, has caused a larger consumption of coal than was calculated upon and accordingly the winter stocks that had been laid in are more nearly consumed than was expected. The stocks on hand, therefore, in that district are not heavy, though we hear of no particular distress.

Trade along the Sound is calling for more coal than can be allowed to that district, and some outside hand-to-mouth buying has had to be resorted to. The matter of boats, which bothered this territory considerably two or three weeks ago, has practically been settled by the milder weather.

New York harbor trade is quieter than it was, some asserting a dullness, but the plentiful supply of coal that has arrived during the last week has provided for all surplus orders. It is reported that one or two of the shipping ports have had all shipments to them embargoed on account of congestion on the main line roads from which they draw their supplies. One other port in addition has been partially embargoed.

All-rail trade is in an active condition, consumers calling for more coal than can be allotted to them. Orders for immediate delivery are out of proportion to standing contracts; producers are accordingly turning away part of their orders with the result that some consumers are obliged to buy outside, at advanced prices.

Transportation from mine to tide is slow and irregular. Considerable congestion of freight is reported on all main line roads, lack of motive power being given as the reason. Car supply is very bad on all roads. Some shippers complain that they do not receive a quarter of their requirements, and reports from railroad headquarters give no hope of an early improvement.

Coastwise vessels are not as plentiful as desired, and freight rates are holding strong at prevailing current prices. Philadelphia quotes 80@85c., alongside, to Boston, Salem and Portland; 70 to 75c. to Providence, New Bedford and the Sound. New York harbor freights are quoted at 70 to 75c. to Boston, Salem and Portland.

#### Birmingham. Jan. 16.

The coal production in Alabama is increasing right along. Not only is a better output reported from the mines of the furnace companies, but the production at the commercial coal companies' mines and at non-union mines is picking up as the demand grows sharper. The cold weather has not interfered much with the production. A heavy rain being experienced for

more than two days, did more damage towards delaying coal production than has the cold weather. Good prices prevail for the product.

During the past week the Seaboard Coal Co. was formed. Coal will be mined at Coal City, in St. Clair county. E. D. Stone is making some borings in Walker county, in the vicinity of America, where mines are to be opened.

Announcement is made that several of the smaller companies in this State are about to form a large coal company by grouping their properties. The properties are now being valued and will shortly be placed in the pool.

Coke production is improving. A number of coke-ovens were started up since the first of the year and preparations are being made to start others.

#### Chicago. Jan. 16.

Notwithstanding the coming of cold weather all over the upper Mississippi valley, the last week has been unsatisfactory to dealers in both anthracite and bituminous. The last three days, however, have shown an improvement in sales of anthracite in both city and country, and the prospects are that with the severest cold spell of the season now on, this week will show a marked improvement. But the winter is half gone, and probabilities are against the theory that there will be continued cold weather. Consumers of anthracite have not bought until they have actually needed the coal, in most cases, and their course has made retailers conservative. All-rail shipments of both anthracite and bituminous are delayed considerably by snow and ice, but this will not be so general a trouble as in previous years, owing to the fairly good dock supplies. There is a scarcity of chestnut, and all-rail business is largest in this; egg and grate are plentiful.

The market for bituminous continues very weak for western coals, and only fair for the most popular eastern coals. No kind of bituminous can be said to be selling well, considering former records for this time of the year. Smokeless shows, perhaps, the most activity, but prices are low, and shipments are delayed greatly. Hocking, usually stable and with no over-supply, has been troubled with too much coal on track, with the consequence that sales have been made as low as \$2.75, against a normal price of \$3@ \$3.20. Youghiogheny is in fair to light demand, bringing \$2.80@\$3. Of western coals, domestic sizes are in best demand, but the market is very weak. Steam lump from Illinois and Indiana mines brings \$1.80@\$2; run-of-mine, \$1.50@\$1.70, and screenings \$1@\$1.40.

#### Cleveland Jan. 17.

The coal trade continues rather easy, with an abundance of steam coal on hand and with the prices easy. The dealers have been able to sell off some of the coal which was in this market a week ago, but the mines continue to ship freely into this territory, and there is evidence of over-production. The consumption is heavy, but the market is constantly flooded. The cessation of the lake coal movement and the lack of any movement of ore from the lake docks to the furnace stock-piles leaves the railroads with an abundance of gondola cars. There are evidences of a shortage of other equipment, but cars are abundant. This leaves a surplus of coal in the Cleveland market. Prices have continued unchanged. Ohio and Pennsylvania coal, run-of-mine, is still

selling at \$1 at the mines, and is weak at this price. There is a steady demand for domestic coal, and the market is strong. There has been some effort made on the part of the people of Cleveland to break the Massillon coal prices, but this has failed, since the Cleveland public has been wedded to this particular grade of coal for a good many years. The price still holds at \$2.55 for selected lump at the mines. There is a steady demand for slack. Most of the contracting has been done, and sales for spot delivery constitute the biggest part of the market. The prices hold at 75c. for Ohio slack at mine, and 70c. for Pennsylvania slack at mine. The coke market is strong, as the ovens cannot make deliveries. The prices have held steady, but a further advance is expected. The best 72-hour foundry coke is selling at \$3.25 at the oven, with furnace coke selling at \$3 at the oven on spot shipment.

#### Pittsburg. Jan. 17.

Coal.—The mines in the Pittsburg district are as busy as the weather and transportation facilities will permit. There was another rise in the rivers during the week and about 6,000,000 bu. of coal got out to the lower markets. Many empty coal-boats and barges have been returned, and when the present severe cold snap is over, active operations at the river mines will be resumed. Prices remain about the same, based on the run-of-mine rate of \$1.10 at mine. The annual convention of the Pittsburg district, United Mine Workers, was in session here all last week and the national convention opened yesterday at Indianapolis. Only business of interest to the organization was transacted, as the wage scale for the Pittsburg district and the States of Ohio, Indiana and Illinois, parties to the interstate agreement, was fixed for two years and does not expire until April 1, 1906. As this is the date for the termination of the agreement made in the anthracite region, it gave some one an opportunity to start a rumor that President John Mitchell would take advantage of the circumstance to demand a heavy advance in wages or order a general strike of both anthracite and bituminous miners.

Connellsville Coke.—Despite the severe weather, the production continues to increase and shipments also are heavier. Prices are somewhat higher, some contracts having been made at the rate of \$2.75 and \$3 a ton for furnace coke. Foundry coke is quoted at \$3 to \$3.50 a ton. The production for the week amounted to 247,000 tons. The shipments for the week aggregated 9,719 cars distributed as follows: To Pittsburg and river points, 3,670 cars; to points west of Pittsburg, 4,989 cars; to points east of Everson, 1,060 cars. This was an increase of 736 cars.

#### San Francisco. Jan. 12.

For Pacific coast coals, in large lots to dealers, quotations are: Wellington and New Wellington, \$8; Richmond, \$7.50; Roslyn, \$7; Seattle and Bryant, \$6.50; Beaver Hill and Coos Bay, \$5.50; white ash, \$5.25. For Rocky Mountain coals, also in large lots to dealers, prices named are \$8.50 for Castle Gate, Clear Creek, Rock Springs and Sunnyside; Colorado anthracite brings \$4. For Eastern coal, quotations are largely nominal, supplies being light. Pennsylvania anthracite is \$14 and Cumberland \$13. For English coal, quotations are, ex-ship; Welsh anthracite, \$13; cannel, \$8.50; Wallsend and Brymbo, \$7.50 per ton.

**Foreign Coal Trade.** Jan. 18.

Export business is quiet. More inquiries for South American ports have been reported lately.

Messrs. Hull, Blyth & Co., of London and Cardiff, report, under date of Jan. 7, that the market for all descriptions continues firm, and an upward movement may be expected. Quotations are: Best Welsh steam coal, \$3.54; seconds, \$3.42; thirds, \$3.12; dry coals, \$3.18; best Monmouthshire, \$3.12; seconds, \$3; best small steam coal, \$2.10; seconds, \$1.92; other sorts, \$1.74.

The above prices for Cardiff coal are all f. o. b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f. o. b. Newport, both exclusive of wharfage, but inclusive of export duty, and are for cash in 30 days, less 2½% discount.

In the freight market there is a good inquiry for tonnage, which, however, is plentiful. Some rates quoted from Cardiff are: Marseilles, \$1.40; Naples, \$1.32; Genoa, \$1.41; Las Palmas, \$1.26; St. Vincent, \$1.38; Rio, \$1.98; Santos, \$2.28; Buenos Aires, \$1.62 per ton.

**Iron Trade Review.**

NEW YORK, Jan. 18.

New business is still only moderate in amount, as it has been since the beginning of the year, but everything indicates active work in prospect. Raw iron continues in demand, and in this respect the main feature has been some additional purchases from outside furnaces by the United States Steel Corporation. Prices in Pittsburg are well maintained, and the Bessemer Furnace Association is refusing to shade at all on large orders. Steel billets are in demand; both bessemer and open-hearth billets and sheet-bars for near deliveries are commanding a premium of \$2 per ton over the association price.

In finished iron, while new orders are slow for the moment, the prospect continues very good, and there are plenty of inquiries for future delivery.

The slowest section of the market is that for steel rails. Beyond the large orders noted a week or two ago very little is being done.

Ore prices have been practically fixed for the season, and sales of over 1,000,000 tons have been made. The range of prices, which will probably continue, is \$3.75 for old-range bessemer, and \$3.50 for Mesabi bessemer, \$3.25 for old range, and \$3 for Mesabi non-bessemer.

**Pig Iron Production.**—The reports of the furnaces on January 1 show that the coke and anthracite furnaces in blast on that date had a total weekly capacity of 377,900 tons. This is an increase of about 20,000 tons over December 1, and is the highest active capacity reported since July 1, 1903. It is a little more than twice that on January 1, 1904, showing the present activity of demand. The charcoal furnaces in blast have an additional capacity of about 36,000 tons per month, making a total of 413,900 tons.

Unsold stocks reported by the furnaces on January 1 were 337,700 tons, a decrease of about 1,000 tons during December. These stocks represent only the holdings of the merchant furnaces, and do not include the iron held by the steel companies for their own use.

**Birmingham.** Jan. 16.

While the aggregate trade was not so extensive, the pig iron market last week was quite strong and inquiry sharp. The indications in the South are for a strong

market for some time to come and the furnacemen are making efforts to improve the production rather than to book more business. The sales for the first quarter of the year will require all the possible make, while a number of orders are on hand already for the iron that will be produced during the second quarter. There is not much iron in the furnace yards in this district. It is stated that iron manufacturers in Alabama are already from 30 to 60 days behind on some of their deliveries, and consumers are urging shipments. The United States Cast Iron Pipe & Foundry Co. will purchase 30,000 tons, but the order has not yet been placed.

The Tennessee Coal, Iron & Railroad Co. during the past week blew in one of the bessemer furnaces. This week the Sloss-Sheffield Steel & Iron Co. will blow in its city furnace, which has been thoroughly repaired. Another furnace belonging to the Tennessee Co. will be blown in next week. The coke and coal supplies are improving.

The following quotations for pig iron prevail in this district: No. 1 foundry, \$14@14.50; No. 2 foundry, \$13.75@14; No. 3 foundry, \$13@13.50; No. 4 foundry, \$12.50@13; gray forge, \$12@12.50; No. 1 soft, \$14@14.25; No. 2 soft, \$13.75@14.

**Chicago.** Jan. 16.

Sales of pig iron have been increasing since the first of the year, but are still confined to small quantities, though numerous. The buyer, speaking generally, is still willing to contract farther ahead than the seller, and with prices not advanced, this condition probably will be changed somewhat to the benefit of the buyer. Inquiries indicate that the total volume of sales for January will be heavy, with the second half of the month showing more favorably than the first half. Optimism continues among selling agents, and everything seems to point to continued prosperity. Quotations are: Northern No. 2, \$17.50@18; Southern No. 2, \$13.50@13.75, Birmingham, or \$17.15@17.40, Chicago.

The greater part of the business of the week has been in Southern, which is not so well sold up for early deliveries such as are in demand. Most of the sales are for the second quarter, but some are reaching over into the third quarter, and in a few cases into the fourth quarter of the year.

Coke is high because of transportation difficulties, that are ascribed to the weather and have caused a shortage. Quotations are in the neighborhood of \$6—this price having been obtained on a number of sales—for 72-hour Connellsville, with standard furnace coke 10c.@20c. lower.

**Cleveland.** Jan. 17.

**Iron Ore.**—The principal interest in the ore trade during the week has been the announcement by the Lake Carriers' Association that it will not recognize unions in making contracts with the men on shipboard during the ensuing year, and the announcement by the unions that they propose to insist upon the recognition of the unions. This promises a struggle at the opening of the season of navigation, which may delay the starting of the shipments of ore down the lakes. There is hardly a possibility that this will mean any hindrance to the blast furnaces, since there is plenty of ore down the lakes to last until well on into June. This is based upon the hypothesis, generally accepted,

that the furnaces have abundant ore on their stock-piles to keep them running until after March 1. The vessel-men are increasing their vessel capacity, and a short season would be desirable to them.

**Pig Iron.**—The market has appeared to be a little soft during the past week, due to the fact that the buying has been in small lots. Some iron has been bought for second quarter delivery, and a little for third quarter delivery, but for the most part the buying is in dribbles for immediate consumption. The prices hold firm. The strengthening influence has been the attitude of the southern furnaces. Some of them have been selling a little iron in this territory, but their prices are too high; they rule at \$13.50@14, Birmingham, for No. 2, while Northern No. 2 is selling at \$16.50 in the Valleys, making the two irons in Cleveland about \$17.35 to \$17.85.

**New York.** Jan. 18.

**Pig Iron.**—Demand for foundry iron continues to be good, and there is no lack of inquiries for future deliveries. Some foundries appear to be short, and are asking for small lots for immediate delivery. It is difficult to get these, except from second hands, and on such orders a premium is generally paid, the amount of which can not be ascertained. Quotations for future deliveries continue without material change.

For Northern iron, large lots, New York delivery, we quote as follows: No. 1X foundry, \$17.75; No. 2X, \$17.50; No. 2 plain, \$16.75; gray forge, \$16.50. Some Virginia basic has been sold at \$17.65, the highest price yet reported.

Southern iron seems to be held firmly on the basis of \$14 Birmingham for No. 2 foundry. We quote for large lots on dock: No. 1 foundry, \$17.75; No. 2 foundry, \$17.25@17.50; No. 3 foundry, \$16.75; No. 4 foundry, \$16.25; No. 1 soft, \$17.75; No. 2 soft, \$17.25; gray forge, \$16.25.

Trade in iron warrants on the Produce Exchange has been rather light, and this kind of business does not seem to increase as its promoters hoped. The following are the latest quotations on the exchange, the first figure named being the bid, and the second the asked price: January, \$16.80—\$16.90; February, \$16.90—\$17; March, \$16.90—\$17.10; April, \$16.90—\$17.20; May, \$16.90—\$17.25; June, \$16.85—\$17.10.

**Steel Rails.**—The regular quotation continues \$28 per ton at mill for standard sections. Light rails are in good demand, and prices range from \$23 for 35-lb. sections, up to \$28 for 12-lb. sections.

**Bars.**—The market continues strong, and demand is very good. Both iron and soft steel bars are quoted at 1.645c. for large lots, tidewater delivery. Store trade is active, with quotations 2@2.10c. for small lots.

**Structural Material.**—More new business is reported, and deliveries are being urged under contracts to a greater extent than heretofore. Beams and channels up to 15 in. are quoted at 1.645c. for large lots, and over 15 in., 1.745c. Angles are 1.645c. in large lots.

**Scrap.**—Old material continues in good demand, and the yards find it difficult to get supplies. Machinery cast is quoted at \$14@15 per ton, according to quality. No. 1 wrought has sold as high as \$20@21. Heavy steel melting scrap brings around \$16.50. These prices are on cars, Jersey City, or other terminal deliveries. Scrap delivered brings from \$1@1.50 per ton more.



Philadelphia. Jan. 18.

**Pig Iron.**—The extraordinary demand for pig iron during the past few weeks has naturally resulted in the temporary withdrawal of most of the larger buyers of iron, and our pig iron people say that those who are now buying belong to the class who very seldom purchase, excepting in a hand-to-mouth way. The upward tendency in prices seems to have been checked; in fact, in two or three instances recently the asking prices have been modified in favor of buyers, and iron has been sold for delivery from 30 to 60 days at a trifle less, though in these cases the iron is classed as ordinary. The same interest is felt in the pig iron market, and a good deal of correspondence is going on between Pennsylvania consumers and makers of iron in Virginia and Alabama, and the meaning of it is not apparent as yet. The foundry people are still buyers in a small way, and have a good many requirements yet to cover. Low phosphorus iron has been bought in small lots, and best brands of forge have been rather urgently inquired for this week, but no sales have been absolutely closed. Quotations for the various kinds may be given at \$18 for No. 1X; No. 2X, \$17.75; forge iron, \$16.50; low phosphorus, \$20@21. These quotations are about as close and accurate as can be furnished.

**Billets.**—The inquiries for billets have subsided, and very little material has been bought, though there is still a good deal of interest felt by our large consumers in late deliveries. Prices are variously quoted from \$25.50 to \$26.

**Sheets.**—Some contracts for heavy and light sheets were closed to-day, on which work will begin about February 1, and on which deliveries will not be completed in two or three cases until some time in June.

Pittsburg. Jan. 17.

The feature of the iron and steel market this week was the purchase by the United States Steel Corporation of 25,000 tons of bessemer pig iron for January delivery. This iron was sold by W. P. Snyder & Co., and the price was the same as for the iron sold for December shipment—\$15.50, Valley furnace. The Snyder interest got 15,000 tons of the Corporation's December purchase, but it is understood that 6,500 tons were not delivered, and this tonnage is included in the present purchase. There are two reports regarding the purchase, but they amount to the same thing. One is that the December iron was cancelled and the purchase was for 25,000 tons, and the other is that the balance of the December order will be filled, together with 18,500 additional tons. The price is the same for both deals. The Bessemer Furnace Association made strong objection to the price accepted by the Snyder Co., and a meeting was held at which it was decided to hold bessemer iron at the minimum price of \$16, Valley furnace. J. G. Butler, Jr., chairman of the association, who was in Pittsburg to-day, says inquiries for iron are numerous and the outlook is better. It is not likely that any more iron will be sold below \$16, even to the Corporation. While there are no indications at present that the leading interest will buy pig iron, it is believed it will come into the market again before the end of the quarter. The furnaces are busy turning out the iron contracted for in December, and a number of them are pretty well sold up for the quarter, and some into the second quarter. Production of pig iron continues to increase. At the opening of the year the production

was at the rate of 20,000,000 tons a year, and it is confidently believed that at the beginning of February the production will be at the rate of 21,000,000 tons annually. While it seems early to make a prediction, some well-informed manufacturers have expressed the opinion that this will be a record-breaking year as to production of pig iron. Ore prices have been practically established for the season, and it is reported that over 1,000,000 tons have been sold. Lake Superior producers are reported to be figuring on bringing down about 30,000,000 tons of ore this season, which will be over 8,000,000 tons more than were shipped during the season of 1904. The new prices said to have been adopted are as follows: Old range bessemer, \$3.75; Mesabi bessemer, \$3.50; old range non-bessemer, \$3.25; Mesabi non-bessemer, \$3.

The market for finished steel products is quiet, and little new business is being placed, but all the mills are busy on specifications. The Carnegie Steel Co. is operating all of its plants in full, except one of the two new Donora blast furnaces; the idle one will be in blast at an early date. The American Sheet & Tin-Plate Co. opened the week with all of its tin-plate mills—242 in number—in operation, and 90 per cent of its 163 sheet mills running. The independent concerns seem to be as busy as the Corporation companies, but many of the sheet and tin-plate interests are having difficulty in getting bars. Bessemer and open-hearth billets and sheet-bars are hard to get, and premiums of \$2 to \$3 a ton are asked. The demand for iron bars is improving, and yesterday the Republic Iron & Steel Co. sold 500 tons at 1.65c, Youngstown. The bi-monthly adjustment of wages under the iron scale of the Amalgamated Association of Iron, Steel & Tin Workers was made during the week. The sales sheets of bar iron of the Republic Co. for November and December were examined and showed an average between 1.3 and 1.4c. This gives the finishers in all union mills in the country an advance of a trifle over 2%. The puddlers, however, will not get an increase until the average selling price is 1.4c. The bi-monthly examinations of the sales sheets for tin-plate and for black sheets also were made, but show no change. The price of sheets is close to the base of the scale, and the tin-plate price is 15c. a box above the base of the scale. The tin-plate workers are certain of an advance of 2% at the next bi-monthly adjustment, which will occur in March.

**Pig Iron.**—In addition to the purchase by the United States Steel Corporation, sales of pig iron during the week aggregated about 3,000 tons of foundry and forge iron. Quotations to-day are as follows: Bessemer, \$15.75@16, Valley furnace; foundry No. 2, \$17.35@17.85, Pittsburg; gray forge, \$16.50@16.85, Pittsburg.

**Steel.**—While the pool price for billets remains at \$21, and sheet-bars at \$23, it is impossible to buy billets at less than \$23@24, and sheet-bars at \$25@26 a ton. Prices are firm in all finished steel lines. Plates continue firm, at 1.50c., and merchant steel bars at 1.40c.

**Sheets.**—The sheet market is strong, and the mills are busy on old contracts, as so far this year but little new business has been placed. It is impossible to shade the minimum prices of the leading interest. No. 28 gauge black sheets are quoted at 2.30c., and galvanized at 3.35c.

**Ferro-Manganese.**—There is no change in the market, and 80% domestic is still quoted at \$43@45 per ton.

## Chemicals and Minerals.

(See also Prices-Current, page 168.)

NEW YORK, Jan. 18.

Gradually the period of stock-taking is coming to a close, and as far as can be learned, first-hands' supplies have been pretty well depleted. Attention is still devoted to renewing contracts, and substantial booking is shown in high-test domestic soda ash for this and next year at 75@80c. per 100 lb. f. o. b. works, and for high-test domestic caustic soda, same deliveries, at \$1.75@1.80 per 100 lb., f. o. b. works. Some large pyrite orders have been slated for long periods, as noted below, while in sulphur, an effort is being made to revive the confidence of importers by reports that the panic in the Sicilian market, as a result of the development of the American industry, is subsiding. In talc there is satisfactory improvement, notably in the high-grade Italian, which shows an increased demand in America. Domestic and French talc are seasonably quiet at steady prices. The report that the mines in the Lipari islands are producing a larger quantity of poorer quality pumice, has stiffened the market somewhat, as the demand here is principally for the higher grade mineral for the finer abrasive purposes. In paris green manufacturing circles there is a better feeling, and the advance in price noted last week, partly explained by the reduction in stocks as a result of the greatly improved demand from the Southern cotton planting districts in 1904, rather intimates that, though no agreement exists among makers, yet all believe in rehabilitating the market.

Of some interest is the incorporation at \$500,000 share-capital of the well-known firm of Wing & Evans, of New York, who have for years represented such prominent chemical manufacturers as Brunner, Mond & Co., of Northwich, England, and the Solvay Process Co., of Syracuse, N. Y. The officers are J. Morgan Wing, president; Louis Stuart Wing, vice-president; Charles H. Sunderland, treasurer, and Edward C. Merritt, secretary.

Authoritative denial has been made of the reported pending consolidation of the firms of Powers-Weightman-Rosengarten Co., of Philadelphia, and E. R. Squibb & Sons, of Brooklyn, N. Y. The promoter was said to be a Mr. Theodore Weicker, for over 20 years connected with the firm of Merck & Co., manufacturers of fine chemicals.

**Copper Sulphate.**—Sympathetically strong, and with higher prices for copper, vitriol makers anticipate a change in their quotations. At present \$5.10@5.25 per 100 lb. rule at New York. Demand is moderate.

**Acids.**—Generally speaking, there has been a slight revival. Rumor is current that the Rankin Chemical Reduction Co., owning the Rankin atmospheric nitric acid process, has purchased the old Scutt wire mill land at Joliet, Ill., intending to erect a plant thereon. It is also stated that the cost of producing the acid from the nitrogen in the air will be materially less than by distilling sulphuric acid with nitrate of soda, as is the general practice. Considering that about 100,000,000 lb. of nitric acid are consumed annually in the United States, the Rankin Co. anticipates a prosperous career. We shall see. Quotations for acids in carboys or tank cars, f. o. b. New York and vicinity, are as follows:

Nitric acid, 36°, 100 lb. ....	\$5.00
38°, 100 lb. ....	5.25
40°, 100 lb. ....	5.50
42°, 100 lb. ....	5.75
Oxalic acid, com'l, 100 lb. ....	5.00@5.25
Sulphuric acid, 50°, bulk, ton. ....	13.50@14.50
60°, 100 lb. in carboys	1.05
60°, bulk ton. ....	18.00@20.00
66°, 100 lb. in carboys	1.20
66°, bulk ton. ....	21.00@23.00

**Sulphur and Pyrite.**—A small importation of brimstone from Sicily is noted, to be delivered on contracts taken some time ago. Foreign best seconds for shipment are quoted nominal at \$21.50 per ton. Domestic seconds, delivered at New York, are worth \$21.45, and prime \$21.75, while shipments to Baltimore and Philadelphia are 25c. per ton higher, and to Portland, Maine, 15c. We have just learned that the French custom authorities, acting on expert testimony, have decided to recall the duty on American sulphur and to admit it free as crude brimstone. Pyrite for delivery during the next two or three years has been contracted for in quantity on basis of current quotations, with, of course, the usual 'inducement' known only to seller and consumer. A large part of this business is on account of South Carolina fertilizer manufacturers, who have recently paid for odd lots on the open market \$5.50@5.75 per ton for lump ore, and \$4.50@4.75 for fines. Importers of Spanish pyrite have recently chartered a steamer of 3,000 to 3,200 tons from Huelva to Atlantic ports at 8s., plus 1s. tax, sailing this month. At 9s. (\$2.16), even though this freight is somewhat lower than was named a month or so ago, is equivalent to nearly 50% of the selling price of pyrite at Atlantic ports. Foreign pyrite, unwashed, analyzing from 46@52% sulphur, is quoted here at 10@11.5c. per unit for lump, and 9@10c. for fines. Domestic lump, 42@44% sulphur, is worth 10@10.5c. per unit at shipping port, and fines, 8.5@10c. per unit.

Concerning the Sicilian sulphur market Messrs. Emil Fog & Sons, of Messina, write under date of January 1 that the panic (incident to the development of the American industry) is subsiding. During this panic many sold short. The chartered vessels now arriving can not be loaded with sulphur from dissidents, their offerings being exhausted, and the Anglo-Sicilian Co. therefore can again enforce its exorbitant prices. Catania, which had also been seized by the panic, is stiffening again. Consumption of refined quality is increasing; the stock at Catania is smaller than last year. Very probably we shall see this spring the same high prices as last year. Total exports from Sicily for the 11 months ending November 30 were 447,604 tons, as against 442,403 tons in 1903. Stocks on November 30 were 382,615 tons, against 366,177 tons a year ago. We quote per ton, f. o. b., as follows: Best unmixed seconds, in bulk, 80s. 6d.; ground seconds, in bags, 88s. 9d.; best thirds, in bulk, 76s. 9d.; current thirds, 72s. 6d.; refined block, 89s. 3d. @ 91s. 9d.; refined roll, 95s. 3d. @ 100s. 9d., and sticks, 103s. @ 105s. 6d.; sublimed flowers, pure, 107s.; current, 99s. 3d.; commercial, 93s. per ton.

**Nitrate of Soda.**—Statisticians are busy forecasting the spring demand, and in certain quarters the expectation is strong that prices will continue at their present high level. At New York spot 96% is quoted \$2.35 per 100 lb., and shipments, \$2.30 @ \$2.325, while 95% is worth about 2.5c. per 100 lb. less. The freight market is firm, and there is reason to believe that the international agreement among shipowners engaged in the nitrate trade, enforced August 15 last, will keep the sched-

ule at 20s. and over. It is noteworthy that this is the first time in the history of the freight market that concerted action has been taken by shipowners of various nationalities for assuring a minimum homeward freight, instead of leaving the current rate to be regulated, as heretofore, by the economic laws of supply and demand. Factors that have aided in maintaining the minimum 20s. rate have been the steady demand for grain bottoms from Australia, and the rise in coal freights across to the west coast of South America where nitrate is loaded. At 20s. (\$4.80) the freight is equivalent to nearly 10% of the selling price of nitrate of soda in the United States.

In the current issue we publish a résumé of the financial operations in the Chilean industry during the past year.

Messrs. Mortimer & Wisner's monthly statement of nitrate of soda, dated New York, Jan. 1, gives the following interesting statistics in long tons:

	1904.	1903.
Imported into Atlantic ports from West Coast S. A. from Jan. 1, 1904, to date .....	239,964	229,889
Stock in store and afloat Dec. 31, 1904, in New York .....	180	2,600
Boston .....	200	.....
Philadelphia .....	.....	3,100
Baltimore .....	3,000	2,000
Charleston .....	3,000	350
Savannah .....	2,000	50
To arrive, due April 15, 1905. ....	77,280	96,850
Visible supply to April 15, 1905 ..	85,660	104,950
Stock on hand Jan. 1, 1904 .....	8,100	7,800
Deliveries past month .....	19,870	17,224
Total yearly deliveries .....	239,684	229,589
Prices current, Dec. 31. ....	2.37½c.	2.17½c.

Quotations are for 96%, 95% can be had at 2½@5c. per 100 lb. cheaper. The increase in 1904 is equivalent to 10,095 tons, and establishes a new high record.

Exports of nitrate of soda to Europe in December were 166,459 long tons; loadings January 1 were 62,068 long tons; imports, 102,390 tons; deliveries in December, 61,480 tons; visible supply, January 1—stocks and afloat—682,300 tons.

**Sulphate of Ammonia.**—Quiet. Good gas liquor, 24@25%, is worth \$3.15@3.20 per 100 lb., according to time of delivery.

**Phosphates.**—Completed statistics for the year 1904 are coming to hand. Exports of high-grade Florida rock from Savannah for the 12 months amounted to 152,456 long tons, principally to Germany, which compares with 156,483 tons in 1903. Considering that Savannah handles annually about one-third of the Florida hard rock exported, the small decrease shown in 1904 suggests that European superphosphate manufacturers are still very good customers.

Phosphates are quoted as follows, per ton:

Phosphates.	F. o. b.	C. i. f. Gt. Britain or Europe.
*Fla., hard rock .....	\$7.25@7.50	\$10.67@11.85
land pebble. ....	3.75@4.00	7.70@ 8.40
†Tenn., 78@80% ....	4.00@4.25	10.27@10.67
78% .....	3.75@4.00	.....
75% .....	3.25@3.50	.....
‡So. Car. land rock ..	3.25@3.50	.....
river rock ..	3.00@3.25	6.38@ 6.67
Algerian, 63@70% .....	.....	7.04@ 7.71
58@63% .....	.....	6.15@ 6.60
Tunis (Gafsa) .....	.....	6.00@ 6.60
Christmas Isle. ....	.....	13.28@14.11
Ocean Isle .....	.....	13.60@14.45
Somme, Fr. ....	.....	11.39

\*F. o. b. Florida or Georgia ports. †F. o. b. Mt. Pleasant. ‡On vessel, Ashley River, S. C.

Liverpool. Jan. 4.

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

Soda ash is firm. For tierces, nearest values are about as follows: Leblanc ash, 48%, £5 @ £5 10s.; 58%, £5 10s. @ £6 per ton; ammonia ash, 48%, £4 5s. @ £4 10s.; 58%, £4 10s. @ £4 15s., net cash. Bags, 5s. per ton under price for tierces. Soda crystals are steady, at generally £3 7s. 6d. per ton, less 5% for barrels, or 7s. less for bags, with special terms for a few favored markets. Caustic soda continues in demand, and prices are fully maintained as follows: 60%, £8 15s.; 70%, £9 15s.; 74%, £10 5s.; 76%, £10 10s. per ton, net cash. Special quotations for the Continent and a few other export quarters. Bleaching powder is in limited export request, but deliveries to home trade are good. For hardwood, £4 15s. @ £5 per ton, net cash, is about range, as to market. Chlorate of potash is without special feature and quoted at 3 1-16d. @ 3 3-16d. per lb., net cash, as to quantity and market. Bicarbonate of soda is moving off steadily at £6 15s. per ton, less 2½% for the finest quality in 1 cwt. kegs, with usual allowances for larger packages,

**Metal Market.**

New York, Jan. 18.

**Gold and Silver Exports and Imports.**

At all United States Ports in December and year.

Metal.	December.		Year.	
	1903.	1904.	1903.	1904.
G'ld Exp	\$1,474,656	\$13,429,415	\$44,346,834	\$121,138,415
Imp	17,230,298	3,336,184	65,267,696	84,803,234
Exc Silv	\$15,765,642	\$10,093,231	\$20,920,862	\$36,335,181
Exp	6,515,653	4,292,161	40,610,342	50,312,745
Imp	2,078,655	2,252,955	23,974,508	26,087,042
Exc E.	\$4,436,998	\$2,039,206	\$16,635,834	\$24,225,708

These exports and imports cover the totals at all United States ports. The figures are furnished by the Bureau of Statistics of the Department of Commerce and Labor.

**Gold and Silver Exports and Imports, N.Y.**

For the week ending January 14 and for years from January 1.

Period.	Gold.		Silver.	
	Exports.	Imports.	Exports.	Imports.
Week ....	\$2,718,130	\$26,826	\$709,317	\$7,046
1905. ....	5,074,500	58,926	1,465,238	36,745
1904. ....	179,891	933,055	2,062,510	42,465
1903. ....	26,905	583,629	1,012,436	105,362

General business is quiet, and speculative markets are somewhat more steady. The movement of gold abroad still continues, and it seems probable that a considerable amount will go out during the present month and February.

Exports of merchandise from the United States in December were valued by the Bureau of Statistics of the Department of Commerce and Labor at \$145,287,264. This is \$12,781,393 less than in November. For the full year the statement is as follows:

	1903	1904
Exports .....	\$1,484,753,083	\$1,451,352,745
Imports .....	995,494,327	1,035,907,370
Excess of imports. . .	\$489,258,756	\$415,445,375
Add excess of exp. silver. ....	.....	\$24,225,703
Add excess of exp. gold. ....	.....	36,335,181
Total excess of exports. ....	.....	\$476,006,259

The gold and silver movement in detail will be found in the table at the head of this column.

The statement of the New York banks—including the 53 banks represented in the Clearing House—for the week ending



January 14, gives the following totals, comparisons being made with the corresponding week of 1904:

	1904.	1905.
Loans and discounts.	\$954,395,600	\$1,064,336,800
Deposits.	941,268,600	1,119,160,100
Circulation.	43,777,000	43,020,100
Specie.	181,679,100	215,591,400
Legal tenders.	76,819,800	88,657,900
Total reserve.	\$258,498,900	\$304,249,300
Legal requirements.	235,322,150	279,790,025
Balance surplus.	\$23,176,750	\$24,458,275

Changes for the week this year were increases of \$9,991,500 in deposits, \$11,907,400 in specie, \$3,441,500 in legal tenders, and \$12,850,025 in surplus reserve; decreases of \$5,405,900 in loans and discounts, and \$152,300 in circulation.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced to dollars:

	Gold.	Silver.
N. Y. Ass'd.	\$1,119,160,100	.....
England.	159,570,300	.....
France.	531,959,630	\$219,026,785
Germany.	181,555,000	60,520,000
Spain.	74,515,000	99,530,000
Netherlands.	28,898,000	31,267,000
Belgium.	16,446,665	8,223,335
Italy.	111,845,000	16,139,000
Russia.	511,565,000	31,590,000
Austria.	240,705,000	61,410,000

The returns of the Associated Banks of New York are of date January 14, and the others January 12, as reported by the *Commercial and Financial Chronicle* cable. The New York banks do not report silver separately, but specie carried is chiefly gold. The Bank of England reports gold only.

Silver has been fairly steady, at a lower level than prevailed in the latter part of December. Orders have absorbed current supplies of metal, but no special keenness to purchase shows itself. The United States Assay Office in New York reports receipts of 82,000 oz. of silver during the week.

Shipments of silver from London to the East from January 1 to 5, inclusive, are reported by Messrs. Pixley & Abell's circular as £363,200 in bar silver to India, as against £386,789 a year ago. Imports were £127,000 in bar silver from New York, and £10,000 from Australia; total, £137,000.

Indian exchange is strong, and all the Council bills offered in London were taken at an average of 16.06d. per rupee, the full amount sold being 80 lakhs. It is reported that the balance in coined silver in the Indian treasury is falling rather low. If this is true, it will indicate early purchases for the Indian Council.

Prices of Foreign Coins.

	Bid.	Asked.
Mexican dollars.	\$0.47½	\$0.49½
Peruvian soles and Chilean pesos.	.43½	.46
Victoria sovereigns.	4.85½	4.87
Twenty francs.	3.87	3.90
Spanish 25 pesetas.	4.78	4.82

Other Metals.

Daily Prices of Metals in New York.

January.	Copper.			Tin.	Lead.	Spelter.	
	Lake, Cts. per lb.	Electrolytic, Cts. per lb.	London, \$ per ton.			New York, Cts. per lb.	St. Louis, Cts. per lb.
12	15 @ 15½	14½ @ 15	68½	29½	4.60	6.20 @ 6.22½	6.05
13	15 @ 15½	14½ @ 15	68½	29½	4.60	6.20 @ 6.22½	6.05
14	5 @ 15½	14½ @ 15	.....	29½	4.60	6.20 @ 6.22½	6.05
16	15 @ 15½	14½ @ 15	68½	29½	4.60	6.20	6.05
17	15 @ 15½	14½ @ 15	68½	29½	4.60	6.20	6.05
18	15 @ 15½	14½ @ 15	68½	29½	4.60	6.20	6.05

London quotations are per long ton (2,240 lb.) standard copper, which is now the equivalent of the former g. m. b's. The New York quotations for electrolytic copper are for cakes, ingots or wire-bars. The usual quotation for Cathodes is 0.25c. below that for electrolytic.

SILVER AND STERLING EXCHANGE.

January.	Sterling Exchange.	Silver.		January.	Sterling Exchange.	Silver.	
		New York, Cents.	London, Pence.			New York, Cents.	London, Pence.
12	4.8745	59½	27½	16	4.87½	60½	27½
13	4.87½	60½	27½	17	4.87½	60½	27½
14.	4.87½	60½	27½	18	4.87½	60½	27½

New York quotations are for fine silver, per ounce Troy. London prices are for sterling silver, .925 fine.

Copper during the past week has shown considerable activity. Not alone have further orders been placed by Chinese merchants and also from Europe, but home consumers have been quite liberal buyers. It appears that all producers are well sold up for the next few months, and it is not unlikely that copper for near-by delivery may command a premium over future options. The closing quotations are given as 15½@15¼ for Lake copper; 15@15½ for electrolytic in ingots, cakes and wirebars, 14¾@14½ in cathodes; 14½@14¾ for casting copper.

The market for standard copper in London, which closed last week at £68 10s., opened a little better on Monday at £68 12s. 6d., improved further, and the closing quotations on Wednesday are cabled as £68 17s. 6d.@£69 for spot, £69 2s. 6d.@£69 5s. for three months.

Statistics for the first half of the current month show a decrease in the visible supplies of 1,100 tons.

Refined and manufactured sorts we quote: English tough, £71@£71 10s.; best selected, £72 10s.@£73; strong sheets, £79@£80; India sheets, £76@£77; yellow metal, 6¾@6¾d.

Exports of copper from New York and Baltimore for the week ending January 17 were 4,349 long tons, making a total of 8,611 tons since January 1, principally for Germany and France. Imports for the week of January 13 were 94 tons copper and \$8,370 worth of ore (quantity not given). From January 1 to 6, inclusive, imports were 37 tons copper and 228 tons ore.

Tin has been in good demand. Spot, being extremely scarce, has ruled at a heavy premium over tin to arrive, and futures. The closing quotations are 29½ for spot, 28¾c. for futures.

The foreign market, which closed last week at £131 5s., showed a decline the beginning of the week to £129 15s., but closes firmer again, the quotations on Wednesday being cabled as £131@£131 5s. for spot, £130 15s.@£131, for three months.

Lead.—The good demand continued throughout this week, but prices remain unchanged at 4.52½ St. Louis, 4.60 New York.

The foreign market has eased off somewhat further, closing at £12 17s. 6d., for Spanish lead, £13 for English lead.

Spanish Lead Market.—Messrs. Barrington & Holt report from Cartagena, Spain, under date of Dec. 31, that silver has been 15 reales per oz. Local price of pig lead has been 70.25 reales per quintal, which, on current exchange—33.73 pesetas to £1—is equal to £11 13s. 2d. per long ton, f. o. b. Cartagena. Exports for the week were 64 tons desilverized lead, and 681 kg. bar silver to Marseilles, the average price of silver for the year has been 14.47 reales per ounce.

Spelter.—In spite of the somewhat higher ore prices, the manufactured article shows a weakening tendency. The closing quotations are 6.20 New York, 6.05 St. Louis.

The foreign market also has shaded off a little, good ordinaries being quoted at £24 17s. 6d., special, £25.

Spanish Zinc Ore Market.—Messrs. Barrington & Holt report from Cartagena, Spain, under date of Dec. 31, that there is nothing new in this market. Prices continue 75 fr. for blende, 35% zinc, and 54 fr. for calamine, 30% zinc. Shipments for the week were 4,250 tons zinc-blende to Antwerp.

Antimony remains unchanged. We quote: Cookson's at 8¼@8½; Hallett's, 8@8¼; Hungarian, U. S., French, Japanese, Italian, and Chinese, 8@8½ per pound.

Nickel.—Producers quote 40@47c. per lb. for large quantities down to ton lots, according to size and terms of order. The price for smaller lots is higher, according to quantity, running up to 60c. for small orders.

Platinum.—Quotations are firm, at \$19.50 per ounce.

Platinum in manufactured forms is strong. Messrs. Eimer & Amend, of New York, quote for different forms, as follows: Heavy sheet and rod, 72c. per gram; foil and wire, 74c.; crucibles and dishes, 78c.; perforated ware, 85c., and cones, \$1 per gram.

Quicksilver.—Quicksilver continues quiet but steady at \$40 per flask in large lots, while \$41.50 is the price for smaller orders. San Francisco prices are lower, \$39@£40 per flask being quoted for domestic orders, with some discount for export. The London price continues steady at £7 15s. per flask, with the same figure quoted from second hands.

Cadmium.—Metallic cadmium, guaranteed 99.5%, is selling in quantities of 100 kg. or over at 710 marks per 100 kg., packing included, f. o. b. Hamburg. This is equivalent to 76.6c. per lb. Prices are for net cash.

Minor Metals and Alloys.—Thalium is quoted at 60@65 marks per kg. at Breslau, Germany. Manganese metal is quoted at 360 marks per 100 kg., f. o. b. Bremen, Germany. Manganese tin alloy, 55%, is quoted 365 marks per 100 kg. for first quality and 225 marks for second quality, both f. o. b. Bremen.

For other minor metals and their alloys, wholesale prices are f. o. b. works:

	Per lb
Aluminum, No. 1, 99% ingots	33@37c
No. 2, 99% ingots	31@34c
Roller Sheets	4c. up
Aluminum-Bronze	20@23c
Nickel-alum	33@39c
Bismuth	\$2.10
Chromium, pure (N. Y.)	80c.
Copper, red oxide	50c.
Ferro-Molybdenum (50%)	\$1.00
Ferro-Titanium (20@25% N. Y.)	75c.
Ferro-Chrom. (74%)	12½c.
Ferro-Tungsten (37%)	45c.
Magnesium, pure (N. Y.)	\$1.60
Manganese, (98@99% N. Y.)	75c.
Manganese Cu., (30@70% N. Y.)	40c.
Molybdenum, (98@99% N. Y.)	\$2.75
Phosphorus, foreign	45c.
Phosphorus, American	70c.
Tungsten (best)	\$1.25

**Missouri Ore Market. Jan. 14.**

A severe blizzard that set in last Sunday has the district covered with ice and snow. At first 10 in. of snow fell, followed by a freezing rain and sleet, compacting the snow into 4 in. of almost solid ice. Not half the mills were running this week, and unless the weather moderates, a less number will be in operation the coming week. Hand jiggling is unthought of, and all prospect work has been brought to a standstill. The shipment of zinc, which practically represents the output for the week, is less than half the previous week, and the lead shipment—less than a third of the previous week—is nearly from the preceding week's output. The Picher Lead Co. in Joplin reported less than 10 tons delivered to its smelter, and the Galena smelter reported no ore delivered.

Some producers think the price of zinc may advance still higher. It is true that it may, as prices are now \$10 to \$13 higher than it was supposed possible last June, when zinc receded to \$35 per ton. Two weeks' restriction changed the downward tendency at that time, and since then advances have continued, to the present unprecedented price of \$58 per ton. Whether the price still further advances rests with a few of the smelters, as a number of them laid in sufficient stock in November and December to carry them over just such an emergency as now exists. Still, these smelters may desire to make those with less forethought pay dear for all the ore they get, and they may dip into the market just enough to keep the price going upward, or keeping it at the present high figure, so long as the cold continues. Even with a limited necessity for ore the small output may create a demand for what is produced.

The highest price reported paid for zinc ore was \$58 per ton for one bin of 53 tons. This price is \$3 per ton higher than the preceding week, and is also \$3 per ton higher than any previous high price, April, 1899, holding that record until this week. The price of lead ore reached \$63 per ton for a few choice bins.

Following are the shipments of zinc and lead from the various camps of the Missouri district for the week:

	Zinc, lb.	Lead, lb.	Value.
Joplin	1,401,670	53,650	\$40,900
Cartersville-Webb City	560,580	176,440	20,420
Aurora	718,340	16,330	13,090
Duenweg	280,840	104,020	10,860
Galena-Empire	337,980	.....	8,780
Badger	134,710	.....	6,570
Carthage	142,350	.....	6,540
Neck City	184,710	12,040	5,290
Alba	87,060	1,580	2,400
Zincite	62,040	.....	1,670
Diamond	46,330	.....	1,170
Carl Junction	41,860	.....	1,170
Granby	48,000	6,000	1,120
Oronogo	31,980	.....	830
Totals	4,278,450	370,060	\$120,810
Two weeks	13,389,360	1,569,770	377,160
Zinc value, the week	\$109,210	two weeks	\$326,720
Lead value, the week	\$11,600	two weeks	\$50,440

**Monthly Average Prices of Metals.**

Month.	SILVER.			
	New York.		London.	
	1903.	1904.	1903.	1904.
January	47.57	57.055	21.98	26.423
February	47.89	57.592	22.11	26.665
March	48.72	56.741	22.49	26.164
April	50.56	54.202	23.38	24.974
May	54.11	55.430	24.89	25.578
June	52.86	55.673	24.29	25.644
July	53.92	58.095	24.86	26.760
August	55.36	57.806	25.63	26.591
September	58.00	57.120	26.75	26.349
October	60.36	57.923	27.89	26.760
November	58.11	58.453	27.01	26.952
December	55.375	60.563	25.73	27.930
Year	53.57	57.221	24.75	26.483

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

**COPPER IN NEW YORK.**

Month.	Electrolytic.		Lake.	
	1903.	1904.	1903.	1904.
	January	12.159	12.410	12.361
February	12.778	12.063	12.901	12.245
March	14.416	12.299	14.572	12.551
April	14.454	12.923	14.642	13.120
May	14.435	12.758	14.618	13.120
June	13.942	12.269	14.212	12.399
July	13.094	12.380	13.341	12.505
August	12.962	12.343	13.159	12.468
September	13.205	12.495	13.345	12.620
October	12.801	12.993	12.954	13.118
November	12.617	14.284	12.813	14.456
December	11.952	14.661	12.084	14.849
Year	13.243	12.823	13.417	12.990

Prices are in cents per pound. Electrolytic quotations are for cakes, ingots or wire bars; cathodes are usually 0.25c lower.

**COPPER IN LONDON.**

Month.	1903.	1904.	Month.	1903.	1904.
Jan.	53.52	57.500	July	56.64	57.256
Feb.	57.34	56.500	August	58.44	56.952
March	63.85	57.321	Sept.	56.82	57.645
April	61.72	58.247	Oct.	55.60	60.012
May	61.73	57.321	Nov.	56.30	65.085
June	57.30	56.398	Dec.	56.36	66.384
			Av., year	57.97	58.857

Prices are in pounds sterling, per long ton of 2,240 lb., standard copper.

**TIN IN NEW YORK.**

Month.	1903.	1904.	Month.	1903.	1904.
Jan.	28.33	28.845	July	27.68	26.573
Feb.	29.43	28.087	August	28.29	27.012
March	30.15	28.317	Sept.	26.77	27.780
April	29.81	28.132	Oct.	25.92	28.596
May	29.51	27.718	Nov.	25.42	29.185
June	28.34	26.325	Dec.	27.41	29.286
			Av., year	28.09	27.986

**LEAD IN NEW YORK.**

Month.	1903.	1904.	Month.	1903.	1904.
Jan.	4.075	4.347	July	4.075	4.192
Feb.	4.075	4.375	August	4.075	4.111
March	4.442	4.475	Sept.	4.243	4.200
April	4.567	4.475	Oct.	4.375	4.200
May	4.325	4.423	Nov.	4.218	4.200
June	4.210	4.196	Dec.	4.162	4.600
			Av., year	4.237	4.309

**SPELTER.**

Month.	New York.		St. Louis.	
	1903.	1904.	1903.	1904.
	January	4.865	4.863	4.689
February	5.043	4.916	4.681	4.717
March	5.349	5.057	5.174	4.841
April	5.550	5.219	5.375	5.038
May	5.639	5.031	5.469	4.853
June	5.697	4.760	5.537	4.596
July	5.662	4.873	5.507	4.723
August	5.725	4.866	5.550	4.716
September	5.686	5.046	5.514	4.896
October	5.510	5.181	5.350	5.033
November	5.038	5.513	4.886	5.363
December	4.731	5.872	4.556	5.720
Year	5.375	5.100	4.931	5.191

**Dividends.**

Company.	Payable.	Rate.	Amount.
American Cement	Jan. 20	\$0.30	\$60,000
Am. Sm. & Ref., com.	Jan. 17	1.25	625,000
Am. Sm. & Ref., pf.	Jan. 10	1.75	875,000
Camp Bird, Col.	Feb. 4	.18	147,600
Central C. & C., com.	Jan. 16	1.50	76,875
Central C. & C., pf.	Jan. 16	1.25	23,438
Central Eureka, Cal.	Jan. 12	.07	28,000
Four Oil, Cal.	Jan. 16	.01	3,000
Homestake, S. D.	Jan. 25	.25	54,600
Jamison, Cal.	Jan. 28	.03	11,700
Mong. River Coal, pf.	Jan. 25	.77	77,000
Monte Cristo Oil, Cal.	Jan. 10	.01	5,000
New Century Zinc	Jan. 3	.01	2,250
New Idria, Cal.	Jan. 2	.30	30,000
Nova Scotia S. D., pf.	Jan. 16	2.00	20,000
N. Y. & Hond., Rosario	Jan. 21	.10	15,000
Oil City Petroleum, Cal.	Feb. 1	.00	2,600
Osceola, Mich.	Jan. 27	2.00	192,300
Peerless Oil, Cal.	Jan. 1	.14	12,880
Penna. Con., Cal.	Jan. 15	.10	5,150
Penoles, Mex.	Jan. 15	18.30	45,750
Phila. Gas, com.	Feb. 1	.75	398,888
Pittsburg Coal, pf.	Jan. 25	1.75	519,771
Pocahontas, Colliery pf.	Jan. 1	.50	7,500
Silver King, Utah	Jan. 10	.66	100,000
Sloss-Sheffield, pf.	Jan. 3	1.75	117,250
Spearfish, S. D.	Jan. 15	.01	22,500
Temple Iron	Jan. 3	3.00	75,000
Tenn. Copper	Jan. 25	1.25	218,750
Thirty-three Oil, Cal.	Jan. 6	.10	10,000
Twenty-eight Oil, Cal.	Feb. 1	.15	9,000
Union, Mex.	Jan. 15	2.30	6,900
Union Nat. Gas.	Jan. 15	2.00	45,000
United Gold, Col.	Jan. 5	.00	20,046
United Petroleum, Cal.	Jan. 16	1.15	16,882
United Zinc, pf.	Jan. 15	.75	14,247
Utah Con., Utah	Jan. 16	1.50	450,000
Va.-Car. Chem., pf.	Jan. 16	2.00	360,000
Vindicator Con., Col.	Jan. 25	.03	.....

\*Monthly. †Quarterly.

**Assessments.**

Company.	Delinq.	Sale.	Amt.
Alpha Con., Nev.	Jan. 4	Jan. 20	\$0.05
Amelia, Utah	Dec. 31	Jan. 20	.00
Andes, Nev.	Jan. 26	Feb. 17	.10
Beck's Salt, Utah	Jan. 16	Feb. 2	.20
Canton Placer, Cal.	Jan. 30	.....	.01
Columbus Con., Utah	Feb. 11	Mar. 6	.20
Con. Cal. & Va., Nev.	Feb. 7	Feb. 28	.25
Confidence, Nev.	Jan. 17	Feb. 7	.20
Eclipse, Utah	Dec. 28	Jan. 27	.00
Elsie, Utah	Jan. 2	Feb. 12	.04
Eureka Con. Drift, Cal.	Jan. 21	Feb. 13	.00
Joe Bowers, Utah	Jan. 9	Jan. 24	.00
Lower Mammoth, Utah	Jan. 21	Feb. 10	.05
Mayday, Cal.	Jan. 24	Mar. 7	.03
Marina Marsicano	Jan. 17	.....	.05
Mexican, Nev.	Jan. 10	Jan. 31	.05
Mohican, Cal.	Feb. 3	.....	.05
Monster, Utah	Jan. 4	Jan. 25	.00
Morgan Argentine, Utah	Dec. 27	Jan. 28	.00
New Montezuma, Cal.	Jan. 25	.....	.02
New Red Wing, Utah	Dec. 31	Jan. 20	.03
O. K. Extension, Utah	Jan. 14	Jan. 31	.00
Overman, Nev.	Jan. 5	Jan. 24	.10
Raft River, Utah	Jan. 11	Feb. 15	.00
Red Slide, Cal.	Jan. 13	.....	.05
Savage, Nev.	Jan. 6	Jan. 27	.10
Seg. Belch. & Mides	Feb. 7	Feb. 27	.05
South Eureka, Cal.	Feb. 6	.....	.02
St. George Copper, Utah	Jan. 10	Jan. 27	.00
Utah Con., Nev.	Jan. 12	Feb. 2	.10
Yellow Jacket, Nev.	Jan. 11	Feb. 16	.10

**Salt Lake City.\* Jan. 14**

Company.	Par Val.	High.	Low.	Shares.
Ajax	\$1	.12	.11	1,000
Butler-Liberal	1	.13	.13	5,500
Carisa	1	.10	.10	1,300
Con. Mercur.	5	.35	.34	1,200
Daly-Judge	20	6.00	6.00	25
Eagle & Blue Bell	1	.80	.80	400
Grand Central	1	3.25	3.25	60
Ingot	.....	.01	.01	2,000
Little Chief	1	.02	.02	4,000
Lower Mammoth	1	.12	.12	300
Mammoth	1	1.25	1.20	700
May Day	1	.12	.09	36,000
Naildriver	1	.35	.27	1,200
N. Y. Bonanza	1	.50	.40	65,700
Sacramento	5	10	10	1,000
Silver Shield	1	.08	.08	1,000
Star Consolidated	1	.13	.11	3,800
Tetro	1	.19	.19	9,600
Utah	1	.37	.37	100
Uncle Sam Consolidated	1	.21	.20	3,200
Victoria	1	2.00	1.99	400



STOCK QUOTATIONS.

**Colorado Springs (By Telegraph).**

Company	Jan. 16		Jan. 17	
	H.	L.	H.	L.
Anaconda	.13	.12	.11	.11
C. K. & N.	.22	.20	.22	.20
Cripple Ck. Con.	.10	.10	.10	.10
Doctor Jack Pot.	.03	.03	.03	.03
Elkton Con.	.68	.67	.68	.67
El Paso	1.50	1.50	1.60	1.58
Gold Dollar	.06	.06	.06	.06
Gold Sovereign	.09	.09	.09	.09
Isabella	.27	.27	.27	.27
Jack Pot.	.06	.06	.06	.06
Last Dollar	.05	.04	.06	.06
Mollie Gibson	.06	.06	.07	.07
Moon Anchor	.09	.08	.08	.08
Old Gold	.09	.09	.09	.09
Pharmacist	.04	.04	.04	.04
Portland	1.95	1.80	1.95	1.80
Vindicator Con.	.07	.07	.07	.07
Work	.13	.13	.15	.14

**Duluth, Minn.**

Company	Par Val.	Bid.	Ask.
Black Mountain	\$1	\$1.10	\$1.25
Calumet & Arizona	10	114.00	115.00
Calumet & Pittsburg	10	6.00	7.05
Houghton Development	10	6.00	7.00
Junction Development	15	72.00	73.00
Lake Superior & Pittsburg	10	50.50	51.00
Pittsburg & Duluth	15	25.50	26.00
Shakespeare	1	.20	.20
United Mexican	10	.20	.20
Wolverine & Arizona	10	6.50	7.00

**St. Louis, Mo.\*** Jan. 14

Company	Par Val.	Bid.	Ask.
Am. Nettie, Colo.	\$10	\$0.15	\$0.20
Center Creek	10	1.40	1.75
Central Coal & C.	100	63.50	64.00
Central C. & C., Pf.	100	70.00	72.00
Central Lead, Mo.	100	120.00	125.00
Columbia Lead Mo.	10	.25	1.90
Con. Coal, Ill.	100	11.00	14.00
Doe Run Lead, Mo.	100	115.00	120.00
Granite Bimet., Mont.	10	.37	.40
St. Joe Lead, Mo.	10	15.50	17.50

\*By our Special Correspondent.

**Montreal.\*** Jan. 14

Company	Par Val.	High.	Low.	Sales.
Dominion Coal	100	63.00	61.00	
Dominion Coal, Pf.	100	116.00	113.00	
Dom. I. & St.	100	19.00		155
Dom. I. & St., Pf.	100	65.50	64.25	
Montreal Steel	100			
Montreal Steel, Pf.	100			
Nova Scotia St.	100	67.00		
N. S. Steel, Pf.	100			

\*Montreal Stock Exchange.

Total sales, 230 shares.

**San Francisco.\*** Jan. 12

Company	Loca-tion.	Opening.		Closing.		Sales.
		H.	L.	H.	L.	
MacNamara	Nev.	.28	.27	.27	.27	1,500
Mont. Tonopah	Nev.	2.10	2.00	2.10	2.10	900
Ton. Belmont	Nev.	.73	.72	.73	.72	7,400
Ton. Midway	Nev.	.34	.34	.34	.34	1,650
Ton. Mg. Co.	Nev.					
Ton. North Star	Nev.		.23	.23	.23	5,600

\*San Francisco & Tonopah Exchange.

Total sales, 17,050 shares.

**(San Francisco By Telegraph.)**

Company	January	
	16	17
Belcher	.21	.19
Best & Belcher	1.05	1.05
Caledonia	.40	.40
Challenge Con.	.22	.22
Chollar	.28	.28
Confidence	.70	.85
Con. California & Virginia	1.70	1.70
Crown Point	.17	.15
Gould & Curry	.20	.20
Hale & Norcross	1.80	1.50
Mexican	2.05	2.05
Ophir	6.12	6.35
Overman	.24	.21
Sierra Nevada	.46	.45
Union Con.	.65	.78
Yellow Jacket	.25	.23

**New York.**

Company	Par Val.	Jan. 11		Jan. 12		Jan. 13		Jan. 14		Jan. 16		Jan. 17		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Amalgamated	100	74	73	74	73	75	73	75	74	77	75	76	74	348,350
Anaconda	25	112	107	111	109	111	108	111	111	112	111	112	111	6,050
Belcher	1													
Best & Belcher	3													
Brunswick	1					10								506
Caledonia	1													
Challenge	2													300
Chollar	50							32						300
Chrysolite	50			.09	.08									600
Con. Cal. & Va.	2			1.85				1.70		1.85	1.50			400
Crown Point	1									.20				600
Elkton Con.	100	61	60							60				1,132
Federal Mining and Smelting	100			.76	.75			.76					.76	400
Preferred	100													
Gould & Curry	1	25	25	26	25	25	26	25	27	26	28	27		34,700
Greene Consolidated Copper	10	6	6	6	6	6	6	6	6	6	6	6		8,900
Greene Consolidated Gold	3									1.53				400
Hale & Norcross	100									1.50				100
Homestake	20									1.50				
Horn Silver	1													
Iron Silver	2					.13								300
Justice	3			2.10				2.05		.07	.06			300
Mexican	5			.06										1,500
Mollie Gibson	25													
Moulton	100													20
Ontario	3			6.75		6.50		6.25						400
Ophir	2													
Overman	1			10		10	.08	10	.08			10		3,500
Phoenix	1					1.80								100
Portland	1													500
Potosi	100									1.75				200
Quicksilver	100													
Quicksilver, pf.	100													800
Savage	3			.50	.49			.47	.46	.48				100
Silver Hill	10					1.50								100
Standard	10													100
Syndicate	25	33		32		32	32	34		34	33	34	34	2,860
Tennessee Copper	100													
Union Consolidated	100													
Utah Copper	100													
Yellow Jacket	3													

Total Sales, 413,518 Shares.

**Boston.**

Company	Par Val.	Jan. 11		Jan. 12		Jan. 13		Jan. 14		Jan. 16		Jan. 17		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adventure Con.	\$25	8	7	8	7	7	7	8	7	7	7	7	7	4,490
Allouez	25	21	20	21	20	21	20	22	21	21	20	21	21	5,675
Amalgamated	100	74	73	74	73	75	73	75	74	77	75	76	75	41,121
Am. Z. L. & Sm.	25			12		12		12				12		230
Anaconda	25					27								200
Arcadian	25									1		1		290
Arnold	25			.95						.75				105
Ash Bed	25							.50						100
Atlantic	25	17	17	17	17	18	17	18	18	18	18	18	17	2,669
Bingham Con.	50	33	33	34	33	33	33	34	33	34		33	33	3,710
Bonanza	10	.80						.80						750
Boston Con.	5	6	6	6	6	6	6	6	6	6	6	6	6	1,900
Calumet & Hecla	25	645	650			655	648	660	655	680	660	690	680	296
Catalpa	10													
Centennial	25	25	25	25	24	26	25	26	24	25	24	25	24	4,239
Con. Mercur.	5	35										35	33	500
Continental Zinc	25											15	15	150
Copper Range	100	69	68	69	68	69	69	70	69	70	69	69	69	8,813
Crescent	10													
Daly-West	20	15	14	15	15	15	15	15	16	15	19	16		8,502
Elm River	12	2	2			3	2	3				3		1,095
Franklin	25	11		11		12	11	12		12	12	12		1,545
Granby Con.	10	5	5	5	5	5	5	5	5	5	5	5	5	24,166
Greene Con.	10	25	25	26	25	26	25	26	25	27	26	28	27	13,880
Guanajuato Con.	10	3	3					3		3	3	3	3	1,538
Humboldt	25													400
Isle Royale Con.	25	26	26	26	26	27	26	27	27	28	27	28	27	4,765
Mass Con.	25	11	9	11	10	11	10	12	11	11	11	10	10	6,645
Mayflower	25													724
Michigan	25	12	10	13	12	14	12	14	14	14	13	14	13	24,337
Mohawk	25	52		52	51	54	52	54	54	53	54	54	54	2,133
Montana Coal & Coke	25			5	4					5	4	5		2,345
National	25													
New Idria	25					.87		1				1		319
Old Colony	25	27		27	27	28	27	28	28	28	28	28	28	1,365
Old Dominion	25	93	93			96	93	96	95	96	95	97	95	2,110
Osceola	10	29	29	29		30	29	30		30	29	29		955
Parrot	25	3												1,305
Phoenix Con.	25	110		110		114	110	115		115		118	115	428
Quincy	25													810
Rhode Island	25													1,010
Santa Fe	10													8,435
Shannon	10	9	8	9	8	9	8	9	8	9	8	9	8	378
Tamarack	25			121				132	130	132	130	134	133	5,265
Tecumseh	25					3	2	3	3					125
Tennessee	25													9,110
Trinity	25	9	9	9	9	9	9	9	9	9	9	9	8	14,797
United States	25	24	24	24	23	24	23	24	24	25	23	24	23	95
U. S.														

STOCK QUOTATIONS.

Coal, Iron and Industrial Stocks.

Company.	Par Val.	Jan. 11		Jan. 12		Jan. 13		Jan. 14		Jan. 16		Jan. 17		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Allis-Chalmers	\$100	16				16 1/2		16 1/2		16 1/2	16	16 1/2	16	1,100
Allis-Chalmers, pf.	100	65				65		65		65	65	65	65	700
Am. Agri. Chem.	100									21 1/2				200
Preferred	100													
Am. Sm. & Ref.	100	82 1/2	81 1/2	81 1/2	81	81 1/2	81	82	81 1/2	83	82 1/2	85 1/2	82 1/2	65,760
Preferred	50	112 1/2	112	112		111 1/2		112 1/2	112	112 1/2	114	112 1/2	112 1/2	6,950
Cambria Iron	50							49		26 1/2	26 1/2	26 1/2	26 1/2	43
Cambria Steel	100	26		26		25 1/2		26 1/2	26 1/2	26 1/2	26 1/2	26 1/2	26 1/2	1,895
Col. Fuel & Iron	100	46 1/2	46	46 1/2	45 1/2	46 1/2	45 1/2	47 1/2	46 1/2	48 1/2	47 1/2	48	47	33,100
Col. Fuel & Iron pf.	100							16						
Col. & H. C. & I.	100			16 1/2	15 1/2	16 1/2	16 1/2			16 1/2	16 1/2	16 1/2	16	2,400
General Chem.	50					60								200
General Chem. pf.	50													
Lehigh C. & N.	50	106				108	106	109		109	108	109	107 1/2	1,023
Mong. R. Coal	50									10	10	10	10	135
Mong. R. Coal pf.	50	30 1/2	30	29	29	29	29	29	29	29	29	29	29	675
National Lead	100	25 1/2	24 1/2	24 1/2		24 1/2		25	24 1/2	25	25	25	25	1,600
Preferred	100	98 1/2				98				98 1/2	98	98	98	810
Phila. Nat. Gas	50	41 1/2	41	41		41 1/2	41	42	41	42	41	42	42	4,054
Preferred	50	46 1/2		47		47		47	46 1/2	47	46 1/2	47	46 1/2	626
Pittsburg Coal	100	21 1/2		21 1/2		22	21 1/2	22	21 1/2	22 1/2	22 1/2	22 1/2	22 1/2	2,910
Preferred	100	83 1/2	82 1/2	82 1/2	82 1/2	82 1/2	82 1/2	83	82 1/2	83	82 1/2	81 1/2	81 1/2	3,319
Republic I. & S.	100	16 1/2	16 1/2	16 1/2	16	16 1/2	16	16 1/2	16 1/2	17	16 1/2	17	16 1/2	5,300
Preferred	100	68 1/2		68 1/2		69	68 1/2	70 1/2	69 1/2	70 1/2	70	69 1/2	69 1/2	3,500
Sloss Shef. S. & I.	100	62 1/2	62 1/2	62 1/2	62	61 1/2	60 1/2	62		62 1/2	62	62		1,200
Preferred	100					100								100
Standard Oil	100	640	638	640	636	641	640	642	640	642	639	641	640	401
Tenn. C. I. & R. R.	100	71		70 1/2	70	71 1/2	70	71 1/2	71 1/2	72 1/2	71 1/2	72 1/2	72	10,600
U. S. Steel Corp.	100	29 1/2	29 1/2	29 1/2	29	30	29 1/2	30 1/2	30 1/2	31 1/2	30 1/2	31 1/2	30 1/2	213,120
Preferred	100	92 1/2	92	91 1/2	93 1/2	91 1/2	94	93 1/2	95	94 1/2	95 1/2	94 1/2	94 1/2	24,135
Va.-Car. Chem.	100	38 1/2	38	37 1/2	35 1/2	35 1/2	34 1/2	36 1/2	35 1/2	36 1/2	35	36 1/2	35	25,650
Preferred	100	108 1/2		108 1/2	107	106	105 1/2	109 1/2	106	108 1/2		108	107 1/2	5,105

\*Pittsburg Exchange; †Philadelphia Exchange; all others, New York Stock Exchange; ‡Ex-dividend. Total sales, 476,511 shares.

Mexico.

Dec. 30

Company.	Shares Issued.	Prices, Mex.		Company.	Shares Issued.	Prices, Mex.	
		Bid.	Ask.			Bid.	Ask.
DURANGO:				San Rafael y An.	1,200	\$740	\$750
Penoles	2,500	\$2,600	\$3,000	aviada	670	1,270	1,300
San Andres de la Sierra	200	10,000		Soledad, aviada	960	290	320
GUANAJUATO:				Sorpresa, aviada			
Cinco Senores y An.	2,000	30	33	MEXICO:			
aviadoras				Aldebarren	2,000	40	55
Cinco Senores y An.	400	30	33	Buen Despacho	3,000	60	68
aviada				Dos Estrellas	3,000	3,100	3,260
Providencia, San Juan	6,000	148	153	La Esperanza (El Oro)	3,000	1,500	1,500
de la Luz				Santa Ana, Esperanza	2,400	15	30
GUERRERO:				NUEVO LEON:			
Garduno y Anexas	7,200	30	35	La Fraternal	1,000	580	620
HIDALGO:				Norias de Bajan	1,000	700	750
Amistad y Con	9,600	65	68	SAN LUIS POTOSI:			
Carman, aviada	1,100	200	220	Concepcion y An.	3,000	26	30
Guadalupe Fresnillo	1,000	170	200	El Barreno, aviadora	2,000	100	105
Mill	1,000	170	200	Sta. Maria de la Paz	9,600	224	225
Guadalupe Fresnillo	1,400	70	80	ZACATECAS:			
Mine				Asturiana y An	2,500	8	12
Maravillas y An., aviador	1,680	90	110	Candelaria y Pinos	2,500	40	50
Maravillas el Lobo	1,000	130	180	San Carlos y Anexas	2,500	35	45
Refugio, aviada	12,800	5	7	Sta. Maria de Gaud.	2,500	55	72
Sta. Gertrudis y An	9,600	8	10	MISCELLANEOUS:			
aviadas				Bartolome de Medina	2,000	90	93
San Rafael y An.	28,800	68	70	Naica (Chihuahua)	100	11,000	13,000
Trompillo	1,200	2,100	2,250	Natividad (Oxaca)	1,800	800	830
				aviadora	6,000	70	78
				San Francisco Hac.	3,000	360	375

Paris.

Jan. 5

Company.	Location.	Par value.	Latest dividend.	Prices.	
				Opening.	Closing.
Anzin, Coal	France	Fr.	Fr.	Fr.	Fr.
			290.00	5,599.00	5,598.00
Boleo, c	Lower California	500	104.17	2,405.00	2,405.00
Courrieres, Coal	France	500	110.00	2,810.00	2,800.00
Huanchaca, s.	Bolivia	125	2.50	102.50	102.50
Laurium, z. l.	Greece	500	25.00	345.00	335.00
Malfidano, z.	Italy	500	50.00	618.00	641.00
Metaux, Cie. Fran. de.	France	500	22.50	501.00	510.00
Mokta-el-Hadid, i. l.	Algeria	500	40.00	1,045.00	1,038.00
Nickel, n.	N. Caledonia	250	22.50	634.00	637.00
Penarroya, Coal	Spain	500	45.00	1,175.00	1,200.00
Vielle Montagne, z.	Belgium	30	30.00	807.00	858.00

c—Copper g—Gold. i—Iron. l—Lead. n—Nickel. s—Silver. z—Zinc.

London.

Jan. 6.

Company.	Par Val.	Latest dividend.		Quotations.	
		Amt.	Date.	Buyers.	Sellers.
American:	£ s. d.			£ s. d.	£ s. d.
Alaska-Treadwell	5 0 4	0	Oct., 1904	4 17 6	5 2 6
Anaconda	5 0 2	0	Nov., 1904	5 8 9	5 11 3
Camp Bird	1 0 9	9	Feb., 1905	1 9 9	1 10 9
Copiapo	2 0 5	0	Oct., 1904	1 7 6	1 12 6
De Lamar	1 0 2	0	Nov., 1904	1 15 0	1 17 6
El Oro	1 0 9	9	July, 1904	1 1 3	1 2 6
Frontino & Bolivia	1 0 0	rts.	Mar., 1904	14 6	15 6
Le Roi	5 0 5	0	Nov., 1899	15 0	17 6
Le Roi No. 2	5 0 1	0	June, 1904	1 0 0	1 2 6
Mesquital	1 0 3	3	Feb., 1903	2 6	3 0
Montana	1 0 6	6	Apr., 1899	6	1 0
Palmarejo & Mex.	1 0 3	3	Nov., 1904	9 3	9 9
Standard	4 14	14	Sept., 1903	1 0	2 0
*Stratton's Indep'd	1 0 6	6	Dec., 1904	5 3	5 9
*St. John del Rey	1 0 6	6	Dec., 1904	12 6	13 6
Tomboy	1 0 1	0	Dec., 1904	1 5 0	1 7 6
*Tye	1 0 2	0	Dec., 1904	2 1 3	2 3 9
Ymir	1 0 1	0	Mar., 1902	3 9	6 3
European:					
Libiola	5 0 1	6	May, 1904	1 11 3	1 13 9
Linares	3 0 5	0	Sept., 1904	4 0 0	4 10 0
Mason & Barry	1 0 7	0	May, 1904	2 17 6	3 2 6
Rio Tinto	5 0 32	6	Nov., 1904	62 10	62 15 0
Rio Tinto, pf.	5 0 2	6	Nov., 1904	6 2 6	6 7 6
Tharsis	2 0 7	0	May, 1904	5 5 0	5 10 0
West Australia:					
Associated	1 0 2	6	July, 1904	2 1 3	2 2 6
Cosmopolitan	1 0 1	0	Apr., 1904	5 9	6 3
Golden Horseshoe	5 0 6	0	Nov., 1904	6 17 6	7 0 0
*Great Boulder	1 0 2	9	Dec., 1904	1 21 6	1 2 0
Gr. Boulder Perse	1 0 1	0	Sept., 1904	10 3	10 9
Great Findall	1 0 7	0	Oct., 1904	8 7 6	8 10 0
Ivanhoe	5 0 5	0	Oct., 1904	8 0 0	8 2 6
Kalgurli	1 0 2	6	Jan., 1905	6 7 6	6 10 0
Lake View	1 0 1	6	Oct., 1904	1 5 0	1 6 3
*Oroya-Brownhill	1 0 4	0	Dec., 1904	3 8 5	3 8 9
Miscellaneous:					
*Brilliant Central	1 0 6	6	Jan., 1905	1 0 0	1 5 0
Briseis	1 0 1	0		11 0	12 0
Broken Hill	8 1 0	0	Nov., 1904	2 3 9	2 5 0
Mt. Lyell	3 0 1	3	Dec., 1904	14 0	15 0
Mt. Morgan	1 0 3	3	Jan., 1905	2 16 3	2 18 9
Waihi	1 0 2	6	Dec., 1904	6 5 0	6 10 0
Indian:					
Champion Reef	10 1 5	5	Jan., 1905	1 13 6	1 14 6
Mysore	10 4 6	6	Nov., 1904	6 11 3	6 13 9
Nundydroog	10 1 6	6	Nov., 1904	1 8 9	1 11 3
Ooregum	10 1 9	9	Dec., 1904	18 6	19 6
Ooregum, pf.	10 9	9	Dec., 1904	1 6 3	1 8 9
South African:					
Angelo	1 0 7	0	Aug., 1904	7 2 6	7 5 0
Bonanza	1 0 7	0	Feb., 1905	1 10 0	1 12 6
British So. Africa	1 0 0	rts.	May, 1899	2 3 9	2 5 0
Cape Copper	2 0 6	6	Jan., 1905	4 15 0	4 17 6
Cape Copper, pf.	2 0 6	6	Jan., 1905		



### Questions and Answers.

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

*Peat.*—I have been trying to find out something about peat from different sources; but information seems to be pretty scarce. As you had a note in the JOURNAL about Canadian peat, I thought possibly you could give me some information about peat in the United States. I remember to have seen, some time ago, newspaper articles about peat in New Jersey and also Long Island, but I am unable to get any information from the papers themselves. What I want to know is simply where peat can be found in quantities, fit for burning purposes. I will be very much obliged to you if you can give me any information, or tell me where to get it.—V. B.

*Answer.*—Beds of peat are found in New Jersey, in several places; on Long Island and in other parts of New York; in the eastern part of Massachusetts; and, doubtless, in many other places. The peat in Massachusetts is said to be the best adapted for fuel uses, probably because it has been tested there more than elsewhere. The fact is that peat has never had a commercial value in this country, and has never been used to any extent. For this reason, there has been no examination of peat beds, nor any investigation as to their character or quality. Facts regarding them are, therefore, difficult to find. If a demand should arise for peat, the necessary investigations would have to be made from the beginning.

The peat beds of Ontario are being worked to some extent, and peat briquettes are made and sold by several companies. An excellent monograph on the subject has been published by the Bureau of Mines of Ontario.

*Arsenic.*—Who are the largest consumers of white arsenic in this country, and what commission houses handle it? What is the duty, if any? About how much is used in the industries like tanning, glass and paint manufacturing? Is there any used in the rubber industry? Where does the Pittsburg Plate Glass Company obtain its arsenic at present?—H. H.

*Answer.*—Briefly, the 4,000 or 5,000 tons of arsenic consumed in the United States annually, is widely distributed, though the larger quantities are supplied to the industries you mention above. It is not known definitely how much arsenic is being employed for vulcanizing rubber, because manufacturers do not desire to take the public into their confidence by

telling what ingredients are used in their processes. It is certain, however, that comparatively little arsenic is used by rubber manufacturers, because of its poisonous qualities. In making ordinary lead shot, it is customary to mix arsenic with the lead in the proportion of about 40 lb. of the former with about one ton of lead. The addition of arsenic to stable manure has proved beneficial as a vermicide, and a considerable quantity has been used, especially in Australia, as a basis of the composition for dipping sheep. Occasionally arsenic is used for hardening iron, and, when dissolved in hydrochloric acid, arsenic will produce a gray color on brass. Realgar, produced in quantity at the Idria quicksilver mines in Australia, and at other places in Europe and America, is applied in the manufacture of fireworks, as well as in the preparation of colors. White arsenic, dissolved in glycerine, makes an admirable mordant for calico printing, but its most extensive use perhaps is in the preparation of alkaline arsenites, Schweinfurt green and other copper colors. In stuffing the skins of animals, arsenic is a good antiseptic, but this use has been rather discouraged for the same reason cited above for the rubber industry. The consumption of arsenic is growing; perhaps, it is encouraged by present low prices, which are partly the result of cheaper production. In America, arsenic is not only recovered from mispickel ores, but in the past year the flue-dust from the Washoe smelter at Anaconda, Montana, has proved a source of an increasing supply. At Freiberg, in Saxony, white arsenic is largely produced from smelter flue-dust, which yields upwards of 25 per cent. At New York importers of white arsenic, paying no duty, quote from 3@3.25c. per lb., while red is worth twice as much. Leading dealers are the Roessler & Hasslacher Chemical Company, 100 William street, New York; Fuerst Bros. & Co., 2 Stone street; McKesson & Robbins, 91 Fulton street, and Edward Hill's Sons & Co., 71 Pine street, New York. A promising competitor is the United States Arsenic Mines Company, of Pittsburg, Pa., which is producing white arsenic at Brinton, Virginia. From whom the Pittsburg Plate Glass Company is buying arsenic is not known.

Thick coal seams are usually worked by pillar-and-stall, though in some cases a longwall system with stopes is practiced.

Some of the text-books have it that friction is determined by pressure or weight, and not by the area of contact of the surfaces. The truth in practice is, that lessening the area lessens the friction; it also lessens the chances of rough surfaces.

### Recent Decisions.

SPECIALLY REPORTED.

**TIN DISKS CONSIDERED AS TIN-PLATES.**—In this case the importer protested against the classification of tin disks at 1½c. a pound as tin-plates. The importer claimed that they were dutiable at 10 per cent as non-enumerated manufactured articles. The protest is overruled, and the disks are held to be tin-plates, and dutiable as such.—Protest of Central Vermont Railroad Company; Board of General Appraisers.

**DUTY ON MICA.**—In this case the collector assessed a duty of 6c. per pound and 20 per cent ad valorem on an importation of mica. The claim was made for the protestants that the merchandise was properly dutiable at 20 per cent ad valorem as a non-enumerated manufactured article, under section 6, but no evidence was submitted to support this claim. The board found that the merchandise was mica splittings, coated with shellac, and held that the coating did not change the character of the merchandise; that it was still mica and nothing else and was therefore properly assessed.—Appeal of Munsell & Co. from Collector of Customs at New York; Board of General Appraisers.

**DUTY ON IRON BARS OR SHAPES.**—Merchandise consists of iron bars or shapes about 6 ft. long and 1½ in. in width, being material for use in the construction of electrical generators. Duty was assessed thereon at the rate of 45 per cent, as manufactures of metal. The only claim in the protest is that the bars are dutiable at 0.5c. per pound under paragraph 125, as structural shapes. We are of opinion that the assessment of duty as made by the collector and the claim set up by the importers are both incorrect. Iron bars are denominatively provided for in several paragraphs of the metal schedule according to their composition, use, etc., and hence do not fall within the provisions of paragraph 193. On the other hand, the articles are clearly not structural shapes, under paragraph 123, as claimed in the protest. We find from the testimony and the sample of the merchandise admitted in evidence that it consists of iron bars or shapes in the manufacture of which charcoal is used as a fuel. As no such claim is made in the protest the same is overruled and the decision of the collector will stand.—Appeal of A. L. Salt from Collector of Customs at New York; Board of General Appraisers.

By bending the teeth of a calyx cutter alternately in and out, the outer teeth form a hole larger than the calyx, and the inner teeth reduce the size of the core; so that there is no difficulty in withdrawing either the drill or the core.

### Abstracts of Official Reports.

#### *Monongahela River Consolidated Coal & Coke Company.*

This company which is known as the River Coal Combine, owns a number of mines in the Pittsburg district, chiefly along the pools on the Monongahela river. It controls practically all the mines shipping down the Ohio river to the ports on that river and the Mississippi. The company is now controlled by the Pittsburg Coal Company, which owns a majority of the stock. The report is for the year ending October 31, 1904. The balance sheet shows that the liabilities are as follows: Common stock, \$20,000,000; preferred stock, \$10,000,000; bonds, \$9,255,000; bonds of subsidiary companies, \$900,680; certificates of indebtedness, \$1,860,000. During the year \$95,000 in bonds were paid off through the sinking fund and cancelled. There were also \$200,000 of the certificates of indebtedness paid off. At the end of the year there was \$139,248 in the sinking fund to be applied to the payment of outstanding bonds. Since the organization of the company, its bonded debt has been reduced \$745,000, and the fixed investments have been increased \$581,217. During the same period 3,742 acres of the company's lands were mined out, and 229 acres sold; while 3,511 acres of coal land have been purchased, making a net decrease of 460 acres in the coal lands owned.

Owing to the difficulties in river transportation, and the depression in business in the early part of the year, there was a considerable decrease in the coal mined and sold. The total for 1904 was 4,158,544 tons, which compares with 7,342,424 tons in 1903, and 6,275,579 tons in 1902. In addition to this coal reported in 1904, there were 421,522 tons mined by the Corona Coal & Iron Company, and 86,212 tons by the Ohio Valley Coal & Mining Company, both of which are controlled by this company.

The detailed statement of earnings and payments for the year, with the changes from the previous year, is as follows:

	1904.	Changes.
Net earnings . . . . .	\$1,727,767	D. \$1,985,603
Less maintenance and depreciation . . . . .	706,003	D. 229,454
Net balance . . . . .	\$1,021,764	D. \$1,756,149
Interest and royalties . . . . .	\$866,998	D. 287,693
Dividend, preferred stock . . . . .	349,825	D. 349,825
Total charges . . . . .	\$1,216,823	D. \$637,518
Deficit . . . . .	\$195,059	
Surplus from 1903 . . . . .	1,958,669	I. \$921,572
Surplus, Oct. 31, 1904 . . . . .	\$1,763,610	D. \$195,059

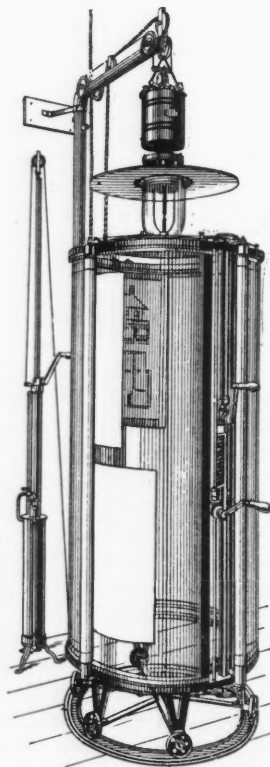
The deficit shown for 1904 compares with a surplus of \$921,572, in the previous year, making a total difference of \$1,116,631.

In his report President Robbins says that the company has passed through a year of trying and unusually severe conditions, and adds: "Floods and ice gorges, followed by six months of low water, accidents incident to marine transportation,

which no care or precaution can prevent, have been bunched the past year, making it at times impossible to operate the mines or to transport the coal when loaded, and have resulted in unusual loss of life and property. These conditions coming in a year of industrial depression have resulted in cutting down the company's revenues and increasing its expenses. . . . . Your property is in better physical condition than ever before. The same conservative bookkeeping that has existed in the past has been sustained and the financial condition of the company is sound and healthy."

#### The Keystone Blue-Print Machine.

Blue-print copying of tracings and designs is thoroughly engrafted into all construction and repair practice. Any substantial improvement in making these



KEYSTONE BLUE-PRINT MACHINE.

copies more quickly or readily is welcomed by all concerned. Such an improvement is shown in the machine herewith illustrated. It is essentially an upright cylindrical frame, about 30 in. in diameter, consisting of two semi-cylinders of glass, together with the appropriate roller-spring curtains on the outside, which hold in place the tracings and paper and protect them from outside light. Down the center of the cylinder is lowered an arc light; this is provided with: (a), a flat screen above and below, so that the effective light striking the tracing shall be mostly normal to the surface; and (b), a hydraulic lowering control, so that the speed shall be even and the illumination regular. Large and small tracings, and several at a time, can be

copied on this machine, which occupies a floor space of about four square feet. The manipulation is simple, the operation is rapid and independent of sunlight, and the cost per copy is greatly reduced. The machine can be handled by a boy, and two large prints can be made in about two minutes. The apparatus is made by the well-known Keystone Blue Paper Company, of Philadelphia. It received the gold medal at the St. Louis Exposition; its manifest usefulness is the best comment.

#### Bauxite Brick.

A new use for bauxite has been found by the American Bauxite Company, of Little Rock, Ark., in the manufacture of refractory brick. The method of manufacture is covered by United States patent No. 775,887, dated Nov. 22, 1904. The value of bauxite as a refractory material has been known for several years, but heretofore it has not been possible to make satisfactory brick on account of the lack of cohesive qualities. It is claimed that this difficulty has been overcome by the new process, and practicable brick are now made for basic furnace lining, which are much cheaper than the magnesite brick now extensively used. The Berger patent covers the use of a binder with calcined bauxite, and in making these brick, a natural bauxite from Arkansas is used, which is very low in silica, and is bonded by a small percentage of plastic fire-clay. The brick contain from 88 to 90 per cent of alumina, and from 10 to 12 per cent of ferric oxide, titanitic acid and silica. The percentage of silica is so low that it is not appreciably detrimental to the basicity.

Bauxite brick seems to be especially adapted for the linings of basic open-hearth furnaces. The highest grade is used in the floor and walls up to the slag line, protected by a bed of calcined bauxite. Above the slag line cheaper brick, with a lower percentage of bauxite, can be used. These brick are manufactured by the Laclede Fire Brick Company, of St. Louis, for the American Bauxite Company. They have been severely tested in some prominent steel works, and have given very satisfactory results. Their cost is considerably less than that of magnesite brick.

Special tests of these brick have been made by immersing them, with others, in a bath of white hot basic slag. In this bath most of the other bricks tried disappeared at least 10 minutes before the bauxite brick began to show signs of distress. Under the most severe trial a good-sized core of unaffected brick remained, even when the other bricks had wholly disintegrated. The company is now putting in a plant to wash the bauxite, and expects to be able to make a brick with not more than 5 or 6 per cent silica. These are to be used for the basic furnaces at the Bethlehem Company's armor-plate plant.



### Patents Relating to Mining and Metallurgy.

The following is a list of patents relating to mining and metallurgy and kindred subjects, issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by THE ENGINEERING AND MINING JOURNAL upon the receipt of 25 cents. In ordering specifications correspondents are requested to name the issue of the JOURNAL in which notice of the patent appeared.

Week Ending December 20, 1904.

- 777,669. PROCESS OF PRODUCING SALTS OF HYDROSULPHUROUS ACID.—Albert Frank, Charlottenburg, Germany. A process for producing hydrosulphites of the alkali-earth metals or earth metals, consisting in bringing a practically neutral solution of bisulphite of the respective metal into the cathode-compartment of an electrolyzing apparatus and electrolyzing the solution under such conditions that the bisulphite solution is kept practically neutral.
- 777,690. STONE-SAW.—John F. Neher, Guthrie, Okla. A stone-saw comprising a blade having a plurality of slightly tapered tooth-sockets arranged perpendicular to the edge of the saw and having flat sides, and a plurality of teeth having flat sides fitted in said sockets but not extending to the bottoms thereof.
- 777,702. SCREEN.—Samuel W. Traylor, New York, N. Y. A screening apparatus comprising a screen having a concave upper surface, means for rotating the said screen, means for vibrating the screen vertically and arresting only its upward movement by impact, and means for feeding the material to the central portion of the screen, said screen subjecting the material to centrifugal force and causing the material to traverse the low part and upward-inclined portion of the screen while subjected to the vibration due to the upward impact, the discharge from the said screen taking place over the outer edge of the same.
- 777,703. SCREEN.—Samuel W. Traylor, New York, N. Y. In combination with a concave screen, rotating about a vertical axis, means for giving it a vertical vibratory movement, a pan of approximately the same degree of concavity as that of the screen, and arranged clear below the lower side of the screen with a small crevice between said pan rotating with the screen, and both the pan and the screen discharging over their outer edges by centrifugal force.
- 777,725. CUPEL.—James C. Fox, Battersea, London, England, assignor to the Morgan Crucible Company, Limited, London, England. A cupel consisting of a homogeneous body, with parallel top and bottom faces, the upper face being provided with a recess to receive the sample to be assayed, and the lower face being hollowed out so that only a small area will be in contact with the surface on which the cupel stands, said homogeneous body having no obstructions within the same to percolation from the top to the bottom thereof.
- 777,728. HEATING-FURNACE.—James H. Haskins, San Diego, Cal., assignor of one-half to International Harvester Company, Chicago, Ill. In a heating and tempering apparatus, in combination with a furnace and cooling-receptacle, a rotating shaft having a series of tongs circumferentially mounted thereon in such relation to said furnace that rotation of said shaft carries said tongs alternately in and out of said furnace, means for intermittently advancing and arresting said tongs, means for feeding articles to said tongs during the interval of arrest, means for delivering the articles to the cooling-receptacle and means for automatically operating said feeding, carrying and delivering mechanism.
- 777,746. REVERSIBLE CONVERTER.—Carl Raapke, Güstrow, Germany. A reversible hearth-converter, comprising an oblong converter, means to turn the converter about its transverse axis, a passage communicating with the interior of the converter and substantially at right angles to its longitudinal axis and to its axis of rotation, chambers, communicating with each other and surrounding said passage, a blast-pipe connected with said chambers and with the bottom of the converter, the converter being provided with a suitable charging and with a suitable delivery opening, one of the said chambers being provided with a side opening and suitable covers to close the said openings.
- 777,750. APPARATUS FOR INDICATING THE MAGNETIC CONDITION OF HEATING METALS.—George W. Sargent, Reading, Pa., assignor to the Carpenter Steel Company, Reading, Pa. The combination with a metal-heating apparatus of a magnet arranged to include in its field the heating metal, and means for indicating the response or non-response of the heating metal to the magnetic influence.
- 777,767. CONTINUOUS DRIER FOR BRIQUETTES.—Colby M. Avery, Chicago, Ill., assignor to Chisholm, Boyd & White Company, Chicago, Ill. A continuous drier having an annular housing, means for heating the same, an annular table in said housing, a plurality of driving-wheels located outside of said table, and a chain passing over said wheels and around said table for driving the latter.
- 777,787. PULVERIZING-MACHINE.—Samuel Hughes, Summerville, S. C. A feed-hopper for grinding of pulverizing machines and the like, comprising a hopper having a fixed spout, an adjustable spout telescoping on the fixed spout, a longitudinal extension depending from the fixed spout to guide the adjustable spout, and means for securing the adjustable spout at any level.
- 777,794. COMPOSITION.—Henry J. Livingston, Baltimore, Md. A composition consisting of the extract of coal-tar obtained by digesting the latter in hot water and combined with hydraulic cements, so as to anneal the same.
- 777,803. GOLD-SEPARATOR.—Thomas Pollock, Santa Barbara, Cal., assignor of one-third to Charles O. Rios, Santa Barbara, Cal. In a gold-separator, the combination of a U-shaped pipe having its arms of different lengths, and disposed vertically, a sand-hopper carried by the longer arm, a valve on the bottom of the hopper, a water-inlet tube beneath and adjacent to the valve and disposed obliquely to the pipe, a normally sealed discharge-outlet arranged in the lowest part of the bend of the pipe, a mercury-chamber carried by the shorter arm of the pipe, a valve in the pipe beneath the chamber, and an outlet-pipe at the top of the chamber.
- 777,814. FURNACE.—William Simpkin, Orange, N. J. In a furnace, a combustion-chamber having outer walls of continuous brick and an inner lining of fire-brick or other suitable material, said inner lining separated from said outer walls by air spaces or pockets divided by fire-brick headers.
- 777,829. PROCESS OF MAKING GAS.—Vincent G. Apple, Dayton, Ohio. A continuous process of fuel transformation which consists in subjecting a constantly renewed body of carbonaceous material to destructive distillation while moving in a heated area, and thereby raising it to incandescence, extracting heat from said incandescent material when removed from said area by water, and thereby converting the water into steam, mixing the steam and the gas of distillation and passing the mixture through the incandescent carbonaceous material.
- 777,834. COMBINED DERRICK AND EXCAVATOR.—Cicero Bishop, Denver, Col. The combination with a mast, a pair of shafts therein, one above the other, a pair of winding-drums on each shaft also arranged relatively in pairs one above the other, means for operating each pair of drums, a boom, a carriage and a bucket, cables connecting both pairs of drums separately with the boom, the carriage and the bucket, and means connected with one of said lower pair of drums for stopping, locking, and starting the carriage at any point in its movements in either direction.
- 777,835. MINE-GATE.—Newton K. Bowman, North Lawrence, Ohio. In combination, a gate operating means for effecting an opening of the gate including a depressible rail, a holder, a second depressible rail, and connecting means between the last-mentioned depressible rail and the holder to project the latter across the path of the gate when open.
- 777,837. ORE-CONCENTRATOR.—Ira A. Cammett, Denver, Col. In an ore-concentrator, the combination of a bowl having discharges respectively for concentrates and waste, an adjustable distributor supported directly from the wall of the bowl and a water seal below the distributor variable through adjustment of the latter.
- 777,838. CONCENTRATOR.—William L. Card and Frank S. Card, Denver, Col. In a concentrator, the combination of a revolving crank, an oscillating crank adapted to have a quadrant-travel arc, an intermediate pitman, a vibrating device actuated by the oscillating crank, and a concentrator-table actuated by the vibrating device.
- 777,870. METAL-PUMP.—Carlos Vellino, Barcelona, Spain. In apparatus for casting lead plates for secondary electric batteries, the combination, with a vessel for containing molten lead and a mold, of a piston-pump located within the lead-containing vessel, a valve arranged to establish communication between the pump-cylinder and the lead-containing vessel below the surface of the molten lead.
- 777,992. PULVERIZING-MILL.—August J. Sackett, Baltimore, Md. In a pulverizing-mill, a rotary, and a fixed disk, said disks having opposed conical faces, yielding devices to draw one disk toward the other, and means to conduct materials to be pulverized between the said disks, combined with conical rolls which are interposed between the said disks, and in the circular movement of the rotary disk are rotated on their axes, and revolved around the said fixed disk.
- 777,927. LADLE.—Richard H. Stevens, Munnhall, Pa. A ladle having a complete supporting bottom shell, a cast-metal false bottom lying on the bottom shell and a refractory lining extending over the false bottom.
- 777,936. KILN.—Robert Booth, London, and Frederick Crosland, Egremont, England. A kiln for calcining lime or other material having a vertical shaft or passage, the top of which is in cross-section longer in one direction than in the opposite direction, said shaft having a bottom portion which is of similar shape to the top but with the longer axis of the elongated section extending crosswise to that of the upper section, and said shaft having an intermediate portion substantially circular in section at one point and gradually conforming, above and below said circular zone, to the shape of the top and bottom portions.
- 777,995. FIRE-BRICK COMPOSITION.—John Anderson, Monaca, Pa. A composition for fire-proofing consisting of silica-sand 90 per cent, asbestos 5 per cent, fire-clay 5 per cent and a sufficient quantity of salt water.
- 778,025. SOLDER FOR ALUMINUM OR ALUMINUM ALLOYS.—Ricardo Fortun and Eduardo Semprun, Madrid, Spain. A solder including silver, aluminum, zinc and tin, at least a portion of the silver, aluminum and tin being phosphorized, and at least a portion of the zinc being sulphurated.
- 778,041. WIRE-MAKING MACHINERY.—James A. Horton, Providence, R. I., assignor to Iroquois Machine Company, New York, N. Y. The combination in a multidrum wire-drawing machine organized for continuous operation, of means for driving the several drums of the

series at successively increasing speeds respectively, a series of dies of successively reduced sizes one for each of said drawing-drums respectively, and a series of wire-forwarding devices mounted one upon each of said drawing-drums.

**778,096. PROCESS OF MAKING COAL BRIQUETTES.**—John W. Barnes, Philadelphia, Pa., assignor of one-half to Clara G. Hobson, Philadelphia, Pa. A process of making briquettes of coal, consisting in intimately mixing granulated coal, molasses, and paraffin, and hot water, then forming the mass into briquettes, then subjecting the same to a temperature of from 280° to 300° F., and then sprinkling said briquettes with a mixture of paraffin and hot water, and finally drying the briquettes.

**778,099. PROCESS OF MAKING SULPHUR TRIOXIDE.**—Henry S. Blackmore, Mount Vernon, N. Y. A process of making sulphur trioxide which consists in inducing the oxidation of sulphur dioxide with a gaseous oxidizing substance capable of producing an endothermic reaction, by supplying heat thereto, and keeping the temperature from rising to the dissociating-point of sulphur trioxide by controlling the heat supplied.

**778,100. ART OF REDUCING ALUMINUM OR OTHER METALS.**—Henry S. Blackmore, Mount Vernon, N. Y. A process of reducing metals which consists in exposing a compound of the metal to be reduced to the action of a substance having such superior affinity for the electro-negative constituent of the compound that heat is evolved in the said reduction, and simultaneously employing the said heat to elevate other ingredients capable of reducing the metal by endothermic reaction to a temperature at which reduction is accomplished, and carrying on the reduction by the action of such ingredients.

**778,149. APPARATUS FOR TREATING PYRITES.**—William B. Simons, Charleston, S. C. In apparatus for treating pyrites for the recovery of sulphur fumes, the combination with a furnace, of two or more series of bars, the bars of each series spaced apart, and said series of bars disposed, one series above and spaced from another, and means for stirring pyrites on one series of bars and causing the same while burning, to descend to the next lower series of bars.

**778,182. HYDROGEN-GENERATOR.**—Herbert S. Elworthy, London, England, assignor of one-half to Ernest Henry Williamson, London, England. A hydrogen-producing furnace including in combination a casing, supply-pipes for steam and reducing-gas, and a large number of separate refractory trays adapted to contain a shallow layer of iron in finely divided form, said trays being built up removably in the furnace in successive courses as a refractory filling, and when in position dividing up the capacity of the furnace into a number of distinct shallow flues or channels running in a zigzag course from bottom to top of the furnace, the heat evolved in the reducing stage being largely saved and stored, while the trays can be readily removed and replaced.

**778,194. ELECTRIC FURNACE.**—Henry M. Howe, New York, assignor to Eimer & Amend, New York. An electric resistance-furnace, consisting of two internally grooved blocks and a cover, in combination with a resistance element in the grooves of the blocks.

**778,195. MANUFACTURE OF BILLETS.**—William B. Hughes, Philadelphia, Pa. A mode of forming billets, consisting in subjecting to shearing and compressing action successive sections of an ingot, which extend from top to bottom of said ingot, each section retaining its proportionate share of the crop end of the ingot.

*Week Ending January 3, 1905.*

**778,840. MEANS FOR OPERATING DIPPER-HANDLES FOR SHOVELS OR DREDGES.**—Erastus S. Bennett, New York, N. Y. In com-

bination with a dipper-handle, a drum and flat bands wound around the drum in opposite directions, and connected one on one side of the drum to the dipper-handle and the other being connected to said handle on the other side of the drum, and means for operating the drum.

**778,846. PROCESS OF COKING.**—Alphons Custodis, Düsseldorf, Germany. A process of making coke which consists in mixing coal with top dust of blast furnaces containing iron, lime, silicic acid, and alumina, grinding the mixture, compressing it into cakes, and coking the cakes, whereby a slag is formed and the iron is reduced to form a sponge.

**778,847. CONCENTRATOR.**—Frederick M. Dillon and Wylie G. Wilson, Denver, Col. A concentrating-table provided with riffles running the whole length of the table, the table having a motion to cause the concentrates to travel in the direction of the riffles and being open to permit the discharge of the concentrates at the rear extremities of the riffles, the said riffles being arranged in groups, the spaces between the groups of riffles being greater than the space between the riffles in any group.

**778,878. APPARATUS FOR FORCING LIME-GROUT, CEMENT, AND THE LIKE.**—Ernest W. Moir, Westminster, England. An apparatus adapted to effect a mixing of material to form lime-grout, liquid cement, or the like, and force it under pressure into cavities to be filled thereby, consisting of a mixing vessel, a cylinder and piston, a passage leading downward from the mixing vessel to one end of the said cylinder.

**778,883. MINER'S DINNER-BUCKET.**—Jesse F. McNeil, Dooley, Va., assignor of one-half to J. E. Trinkle, Dooley, Va. A miner's dinner-bucket consisting of a case having a fixed bottom above its lower end, a removable-compartment tray supported above the bottom by brackets projecting from the walls of the case, a removable cover snugly fitting the case and supported on the partitions of the tray and having a single vent-tube communicating with the several compartments of the tray, and a cap having outward and depending flanges and an opening to receive the vent-tube of the cover.

**778,897. MOTOR CONTROL FOR HOISTING-BUCKETS.**—Lewis J. Robb and William M. Rosewater, Pittsburg, Pa., assignors to Heyl and Patterson, Pittsburg, Pa. In a system of motor control, the combination with two motors, of independent starting and stopping means therefor, a single operating means, and connection between the same and said starting and stopping means so arranged that by a single movement of said operating means in one plane both of said motors may be put and maintained in operation, and one thereof started in advance of the other.

**778,899. METHOD OF FORMING BLOCKS OF ORE FOR METALLURGICAL PURPOSES.**—Árpád Rónay, Budapest, Austria-Hungary. A method of rendering material capable of use for metallurgical purposes by converting it into blocks by means of pressure and the exposure of the blocks to the action of combustion gases containing carbon, which consists in subjecting the material, which may be in a finely granular form or in certain cases in the form of powder to a pressure increasing gradually to a very high degree, so that the air entirely escapes from the material during the pressing operation, and the pressure is only carried at the last stage to such a degree as to render the material plastic.

**778,901. PROCESS OF REDUCING LEAD ORES.**—Pedro G. Salom, Philadelphia, Pa. A process of reducing lead ore which consists in continuously spreading the ore in a finely ground condition upon the surface of a suitable cathode, in the presence of a suitable electrolyte and a suitable anode; maintaining the ore upon the cathode until complete reduction has occurred; and then continuously removing the resultant mass of spongy lead from the cathode-plate at a rate corresponding to the rate at which the ore is spread.

**778,917. INGOT-CHARGING CRANE.**—Clarence L. Taylor, Alliance, Ohio, assignor to the Morgan Engineering Company, Alliance, Ohio. In ingot-charging apparatus, the combination with a bar and two movable racks carried thereby, of ingot-grasping tongs, and means actuated by said racks for opening and closing the tongs.

**778,919. MINE-CAGE.**—Peter Thielmann and Johann Meisenburg, Duisburg, Germany. An improved mine-cage comprising in combination with the usual cage-frame, a loose platform on said frame, downwardly projecting catches loosely fixed in the platform, nuts on the upper end of said catches, two parallel or cross axles rotatably mounted in suitable bearings on the lower surface of the platform, curved levers pivoted on the ends of said parallel axles and projecting with their upper ends through the platform, connecting-rods connecting the lower ends of each pair of curved levers and safety-bars at the side of the cage consisting of upright supports fixed to the cage-frame, suitable bearings at the upper end of the same, an axle mounted in said bearings, horizontal levers fixed to the end of said axle, connecting-rods linked to said levers and push-rods loosely resting on the platform with their lower ends and linked with their upper ends to the other end of the connecting-links, there being eyes fixed to the uprights serving as guides for the vertical push-rods.

**778,951. WELL-DRILLING APPLIANCE.**—John H. Compton, Malden, Mass. A drilling appliance comprising a suspended member and a tool-carrying member movable longitudinally with respect to each other and provided with opposed surfaces.

**779,017. ROCK OR LIKE DRILL.**—William Wilson, Cleator Moor, England. In a rock-drill, the combination of a cylinder having an axial way through the back thereof, a hollow piston working within the cylinder, a hollow rifle-bar working within the hollow of the piston and formed of shorter length than said hollow, a hollow piston-rod fixed with the piston, a hollow chuck removably fixed with the piston-rod and adapted to receive a hollow bit, a pipe connected with a water-supply exteriorly of the cylinder and passing through and fixed with the cylinder end and loosely passing through the bore of the rifle-bar and entering the bore of the piston-rod and a stuffing-box beyond the end of the rifle-bar within the hollow of the piston for forming a fluid-tight joint between the pipe and the piston and piston-rod.

**779,022. APPARATUS FOR CONTINUOUS EXTRACTION OF SOLUBLE MATERIALS.**—Edouard Bataille, Paris, France. For the continuous treatment, by means of a solvent of materials in the form of grain, paste, or pulp, a closed washing-receiver divided into longitudinal compartments in form of troughs disposed horizontally at the same uniform height and in communication with each other alternately by their opposite ends, a horizontally disposed worm mounted in each compartment and with threads arranged in opposite directions for drawing in the material, wheels with inclined blades mounted on the screw-shafts for projecting the material from one compartment to another and baffles freely suspended above the screws in each compartment.

**779,037. METHOD OF SMELTING ORE.**—James Gayley, New York, N. Y. A method of smelting ore, which consists in subjecting the ore with carbonaceous fuel to a blast of dried air, the burden of fuel being less than the normal burden by an amount materially greater than that which would be required to dissipate the eliminated moisture.

**779,043. EXCAVATING APPARATUS.**—George H. Hulett, Cleveland, Ohio, assignor to the Wellman-Seaver-Morgan Company, Cleveland, Ohio. The combination of a track laid longitudinally in the cut, a steam-shovel or other excavator mounted thereon, a second track parallel wit



the first track, a truck carrying a hopper and feeder on said second track, an elevating-conveyer also carried by the truck carrying the hopper and feeder, and an endless-belt conveyer receiving the spoil from the elevating-conveyer and located at right angles to the excavation and mounted to move in the direction of length of the latter.

**779,045. ROLLER CRUSHING-MILL FOR ORES.**—George Johnston, San Francisco, Cal. In a roller ore-crushing machine, a base-frame, with pan, die-ring, and edge rollers running on said die-ring, in combination with a fixed hollow central standard firmly secured to said base-frame, forming a central conduit for the ore-supply and a lateral support for the revolving parts, with outlet-passages in said fixed standard at the bottom through which the ore is delivered to the crushing-path from the inner side at multiple points.

**779,058. PROCESS OF RECOVERING METALLIC COMPOUNDS FROM SOLUTIONS.**—Samuel W. Vaughn, Lorain, Ohio, and John W. Cabot, Johnstown, Pa. In the recovery of metallic compounds from solutions of their salts, the process of precipitating them as iron cyanides by mixing such solutions with a solution of the iron cyanides of an alkali, separating the precipitated solids from the residual liquid, recovering the residual salt of the alkali produced by the iron cyanide used from the residual solution, transforming the precipitated iron cyanides into oxyhydrates by treating them with caustic alkali, simultaneously recovering and reconstructing the iron cyanides of the alkali originally used, and finally, precipitating the excess of precipitant in the original solution by adding to the solution first operated upon, a soluble zinc salt, and separating and recovering the zinc iron cyanide thereby produced from the containing liquor.

**779,074. FRAME FOR COVERS FOR CRUCIBLE STEEL-MELTING FURNACES.**—Charles W. Cowen, Reserve township, Allegheny county, James H. Turner, Pittsburg, and Robert C. McLellan, Washington, Pa. In a frame for a cover for crucible steel-melting furnaces, four arched bars joined at or near the ends by plates, and near the center by a plate; and between the center and end plates by four other plates, two on each side of the center plate, which join the four arched bars into two pairs; being substantially the main body of the frame.

**779,091 and 779,092. PROCESS OF MAKING SILICO-FLUORIDE OF LEAD.**—Walter Mills, London, England, assignor to A. O. Granger, Cartersville, Ga. A process which consists in subjecting galena and cerusite to the action of hydrofluosilicic acid and blowing air through the mixture during the reaction.

**779,119. ROTARY FURNACE.**—Hugh C. Davey San Jose, Cal. An improved ore-roasting apparatus having in combination a plurality of inclined revoluble cylinders, each having a conical receiving end forming substantially a close joint through the masonry in which it is turnable, an enlarged head rigid with the discharge end of the revoluble cylinder, said head having an outwardly extending annular flange, a stationary head abutting the head of the cylinder and having an annular channel interior to one end to receive said flange, a furnace proximate to the stationary head and delivering the products of combustion thereinto and into the cylinder, said stationary head having a delivery-chute, and an open unenclosed receiver in communication with the said chute and interposed between the same and the conical inlet of the succeeding cylinder.

**779,171. MANUFACTURE OF TOOL-STEEL.**—John A. Mathews, Syracuse, N. Y., assignor to Crucible Steel Company of America. High-speed steel containing not less than 10 per cent of vanadium.

**779,192. MACHINE FOR CASTING METAL.**—Carlos Vellino, Barcelona, Spain. In a mold having a molten-metal inlet and an air-outlet,

means for cooling a zone in proximity to said inlet and a zone in proximity to said outlet.

**779,196. CLAY PRODUCT AND PROCESS THEREFOR.**—Dick B. Williams, Scottsdale, Pa., assignor of one-half to Joseph R. Stauffer, Scottsdale, Pa. A process for making an abrasive product consisting in first mixing green clay with a quantity of previously hardened abrasive material, and subsequently treating the mixture to the exclusive action of the gas evolved from a body of heated carbon.

**779,195. PROCESS OF TREATING CLAY.**—Dick B. Williams, Connellsville, Pa., assignor of one-half to Joseph R. Stauffer, Scottsdale, Pa. A process for treating clays, which consists in subjecting a molded natural clay form to the action of an incandescent body of amorphous carbon while enveloping the form and confined in a sealed chamber.

**779,197 and 777,198. DISTILLATION AND TREATMENT OF CRUDE BITUMINOUS MATERIAL.**—Horace W. Ash, Cambridge, Mass., assignor to Warren Brothers Company, Boston, Mass. A method of distilling and inspissating crude bituminous material herein described, the same comprising the subjection of the said material in a still to a distilling heat and depositing in the distilling material an impalpable powder.

**779,205. BREAKING OR SIZING AND DISTRIBUTING COAL OR SIMILAR SUBSTANCES.**—Jeremiah Campbell, Newton, Mass. In a machine for breaking and distributing coal, a hopper, the walls of which form a continuous closure with a restricted outlet, a guideway on a wall of said hopper substantially in alignment with said outlet, a reciprocating ram or plunger within said hopper, and arranged to be guided by said guideway to coact with the walls of the hopper to crush the material within the same.

**779,210. PROCESS OF PRODUCING BARIUM OXIDE FROM BARIUM CARBONATE.**—Georg Egly, Charlottenburg, Germany, assignor to Gebrüder Siemens & Co., Charlottenburg, Germany. A process of producing barium oxide consisting in mixing barium carbonate with barium nitrate in substantially the proportions named and then heating the mixture to the required temperature.

**779,238. RUST-PREVENTING COMPOUND.**—Hosea J. Romick, Hilliard, Ohio. A compound consisting of the following ingredients in substantially the proportion specified by weight, red lead 8 parts, raw linseed-oil 8 parts, japan drier 2 parts, portland cement 24 parts and asbestos fiber  $\frac{1}{4}$  part.

**779,251. DRILLING AND SAMPLING APPARATUS.**—Ralph Baggaley, Pittsburg, Pa. Apparatus for sampling metal comprising a table or holder for the metal piece and a laterally movable drill on the under side thereof.

**779,275. HOISTING APPARATUS.**—Archibald M. Green, Chelsea, Mass., assignor of one-half to Frank A. Marston, Winthrop, Mass. A hoisting-bucket having a fair-lead provided with a plurality of double-grooved rolls pivoted with such relation to each other as to form a central passage with a plurality of arc-shaped bearings for the rope, each groove of each roll cooperating with the adjacent groove of the adjacent roll so that the two will form together an antifriction-bearing.

**779,290. PROCESS OF MAKING SODIUM ACETATE.**—Lena P. Lihme, Cleveland, Ohio, assignor to the Grasselli Chemical Company, Cleveland, Ohio. A process for producing sodium acetate, which consists in subjecting a solution containing calcium acetate to an excess of sodium sulphate, converting such excess of the sodium salt and the dissolved calcium sulphate, produced, into carbonates, by the addition of barium carbonate, concentrating the solution, subjecting it to an oxidizing medium, and effecting the crystallization of the sodium acetate.

**779,297. CLAMP FOR HANDLING METALLIC OR OTHER VESSELS.**—Sydney E. Love and William J. McRae, Gre Gre Village, near St. Arnaud, Victoria, Australia. An improved clamp for handling metallic or other vessels consisting of an upper and lower clamping-bar having upper hooks and lower catches thereon each meeting end of which bars has a tongue and a pocket and a side stop, each meeting end having also a pivot-pin therein pivoted to a fastening-lever, said fastening-lever having a finger-piece thereon and retained against the upper clamping-bar by a stop, in combination with a handle, the lower portion of which is attached to the lower clamping-bar and upper portion of which has a thumb-piece thereon.

**779,307. PROCESS OF MANUFACTURING MINERAL WOOL.**—Thomas B. Parkison, Muncie, Ind. A process for the production of mineral wool which consists in subjecting the molten slag or scoria to the action of smoke.

**779,310. PROCESS OF OBTAINING METALS FROM THEIR ORES.**—Samuel Peacock, Chicago, Ill. A process of treating ores containing iron and zinc, which consists in roasting the same, reducing the iron to a metallic state at a temperature too low to reduce the zinc to a metallic state, separating the iron from the mass and then reducing the zinc to a metallic state.

**779,365. GOLD-SAVING APPARATUS.**—Edward S. Kelley, St. Joseph, Mich., assignor of one-half to Willis W. Cooper, Kenosha, Wis. In a gold-saving apparatus, in combination, a bucket having an outlet-opening in its side above its lower end, said bucket being adapted to contain a quantity of mercury, a funnel in said bucket having an elongated narrow discharge-opening facing away from said outlet-opening and arranged to be submerged in the mercury in said bucket; and an inclined amalgamated plate extending from said funnel to said outlet-opening, the lower edge of said plate being raised above the bottom of said bucket.

**779,383. ELECTROLYTIC APPARATUS.**—Clinton P. Townsend, Washington, D. C. An electrolytic cell, comprising a vessel having two compartments, a pervious cathode between said compartments, an anode and a body of electrolyte in one compartment, and a body of a liquid which is substantially immiscible with and inert toward a cathode product of the electrolysis, in the other compartment.

**779,384. ELECTROLYTIC PROCESS.**—Clinton P. Townsend, Washington, D. C. A process of electrolyzing solutions, which consists in passing an electric current through the solution to a cathode, and recovering a cathode product of electrolysis by means of a liquid which is substantially immiscible with and inert toward said product.

**779,385. COMPRESSOR.**—Warren P. Valentine, Westfield, N. J. In an air-compressor, the combination of a cylinder having the same diameter at both ends and a reciprocating piston fitted thereto, one end of the cylinder constituting a working chamber and having means for controlling admission and exhaust of motive fluid thereto and therefrom, the other end of said cylinder constituting a compression-chamber, and having means controlling admission and discharge thereto and therefrom, said cylinder and piston having between them a supplemental exhaust-chamber, said exhaust-chamber located intermediate said working and compression chambers, and said cylinder provided with a supplemental exhaust-passage communicating with said exhaust-chamber.

Reissue No. 12,301. **PROCESS OF ELECTROLYTICALLY REFINING LEAD.**—Anson G. Betts, Lansingburg, N. Y. Original No. 713,277 dated November 11, 1902. A process of electrodepositing lead, which consists in subjecting to electrolysis an electrolyte containing a lead salt of a fluorine acid, and an agent capable of restraining the crystallization of the electro-deposited lead.

## Special Correspondence.

San Francisco. Jan. 12.

A jury has been secured and the taking of testimony has begun in the suit of eight farmers and fruit-growers of Shasta county against the Mountain Copper Co. for damages alleged to have been done to their crops by fumes from the smelting plant at Keswick. This company is carrying on more extensive operations than any other mining company in California, and employs the largest number of men. It has recently acquired a tract of land at Bull's Head Point, on San Francisco bay, where it is erecting a large plant for the manufacture of sulphuric acid, fertilizers, etc. The highly sulphuretted ores will doubtless hereafter be utilized at this new plant. A very satisfactory arrangement has been made with the railroad companies, which permits the shipment of ore from the mine to the plant, a distance of a little over 200 miles. The bulk of the ore, however, will continue to be treated at the main smelter, Keswick, Shasta county. At that place at present all the roasters are now being used, and large quantities of ore are being reduced. A new feature is the handling of ores from Tonopah and Goldfield, Nevada, this being done as custom work.

The Champion and Home Mining companies, of Nevada City, have signed an agreement by which continuance of work on both properties is permitted pending the litigation as to rights in certain disputed ground. The companies have sued each other and operations were suspended. The attorneys for the companies have signed a stipulation which has been approved by the judge of the superior court. By this agreement the disputed ground is definitely described, and it is stipulated that ore shall not be removed from it during the pendency of the litigation. Operations elsewhere may be resumed. Either party may continue the work of exploration in the disputed ground, but no stopping shall be done, and whatever ore is encountered in the exploratory work shall be stored and be subject to the determination of the controversy in court. Each party gives the other the privilege of inspecting and surveying its underground works prior to the termination of the trial and the submission of the case.

At Oroville, the "black sand" suit has been decided against the Long Mining & Mineral Extracting Co., which was sued for the cost of certain machinery supplied. This company built a plant at Oroville, which was apparently a failure, as it has been some time closed down by financial entanglement. The company was to make great fortunes from the black sands obtained by the dredgers in that section. The judge has decided that failure of the venture does not render the machinery purchase contract void. The machinery was to be paid for in three installments, one of which had been paid. The company wanted to return it to the seller, and thus settle the claim, but he contended that the contract meant a sale, and the court so held.

The Independent Oil Agency, of Bakersfield, represented by 18 prominent companies, has signed a contract with the Associated Oil Co., which practically means the delivery of 4,000,000 bbl. of oil, at 18 cents a barrel, between now and January 1, 1906. It is thought that in view of this arrangement a number of wells, closed since last August, will now resume pumping, and there will be renewed activity in the field. The companies signing represent 12,000 bbl. daily yield, but some

17 companies are yet to sign the agreement. The contract gives the well-owner half a cent a barrel more than the Associated Oil Co. has been bidding, though some recent sales in the Kern field have been made as high as 20 cents per barrel. The deal is considered a proof that the consumption of crude oil is keeping pace with the increased output.

The Mount Alamo Mining Co., owning mica mines in Ventura county, has established a factory at West Berkeley, Alameda county, where the crude product will be worked up into mica segments, washers, tubes, troughs, mica conduit for electric wires, etc. They will also grind mica and make mica pulp for wall paper. This class of manufacture is a new one in California to utilize this mineral product of the State. The mica heretofore used locally has been imported.

It is reported that operations are to be resumed on the properties of the Copper King, Ltd., near Clovis, Fresno county, and Charles Leavitt, of this city, has gone down to the mines to take charge. This is the property which was closed down some time ago, after large sums were spent on the mine and in the smelting plant, which is located on the San Francisco bay shore. Considerable litigation ensued on the closing down of the property, which has laid idle a couple of years, meanwhile being in the hands of a receiver. The company was an English corporation. There are rumors that the Brown Bear mine, of Deadwood, Trinity county, has been sold. The mine was a large producer for many years, but of late the only work done upon it has been by leasers. There are extensive tunnels on the property and a fine mill.

Denver. Jan. 13.

It is probable that a bill will be introduced in the present Legislature, changing the laws in regard to the inspection of coal mines, in order to make the condition of the workmen more safe in the future than has been the case in the past. The present State coal mine inspector will probably have more assistance in his work, in order that every coal mine in the State can be examined at least once every three months, which the present law requires, but which it has not been possible for two men to do.

Large orders are coming in to the Colorado Fuel & Iron Co., and the Minnequa plant at Pueblo is the scene of great activity. President Hearne is at present in New York, consulting with the directors in regard to the necessary changes and improvements, and the policy for the present year. Since the reorganization of the company, five new blast furnaces have been added and another is being constructed. It is understood here that the Interstate Commerce Commission has notified President Repley, of the Atchison, Topeka & Santa Fe railroad, that a re-hearing would be given in Chicago on the case in which the railroad company is charged with having granted certain rebates to the Colorado Fuel & Iron Company.

The Portland Gold Mining Co. has declared its regular quarterly dividend of six cents per share, amounting to \$180,000, which makes a total of dividends paid of \$5,750,000. It seems probable that J. F. Burns will not be re-elected president at the next annual meeting. Besides that gentleman, there are four directors, and these four have issued a statement to the stockholders, from which it appears that they do not advise them to vote for Mr. Burns as a director. These four have re-

pudiated various acts of the president, especially in connection with the labor troubles, during the past year.

The Vindicator also declared its quarterly dividend this week, amounting to \$33,000. This is the 27th and the total is \$1,247,000.

The statement of the earnings of the Denver & Rio Grande and Colorado & Southern railroads for the month of December show an increase of \$297,863 over the same period last year.

Houghton. Jan. 14.

It is quite probable that the Phoenix Consolidated company, of Keweenaw county, will open another shaft next spring. Although the step has not been definitely decided upon, the undertaking is reasonably certain. Since the closing of the shaft on the West vein, which had been under development for a number of years, the ore supply has been inadequate to feed the mill to its normal capacity. Work on the West vein was discontinued owing to the very poor showing which it made, rock from it yielding as little as five pounds of copper per ton. The St. Clair vein, however, on which all work is now conducted, reveals increasingly good values as depth is gained. It is planned to sink a vertical shaft, which would strike the vein at good depth. By this course there would be very little distance for the rock to be transported, the mill being near.

There was a considerable falling off in production in the lake district in December, owing to the severe blizzard which swept northern Michigan, causing loss of life and a general suspension of business.

Returns from the Michigan show steady improvement, last month's product of 177 tons of mineral being the largest in its history. Rock shipments average 480 tons daily, and the mineral yield of close to one and one-half per cent. "A" and "B" shafts have reached the 14th level at a depth of 1,781 ft. The mine is operating 36 drills, 27 stopping and the remainder drifting, no sinking being under way at present.

Owing to the change in the system of mining which is in progress at the Atlantic mine, production is temporarily curtailed. Last month's output was further reduced by an accident which disabled the hoisting engine at "D" shaft one week, during which period rock shipments were 700 tons daily, half the usual amount. While the work incident to the change in the system of conducting underground operations causes a smaller output at present, the ultimate results will be beneficial, as the timber requirements will be lessened and a larger vein extraction made possible.

Despite the bursting of the main water pipe at the stamp mills, causing the idleness of three heads for four days, the Quincy mine showed no diminution in output in December.

Sinking in No. 3 shaft of the Mohawk mine is in progress and will reach the eighth level in a short time. Owing to the fire which destroyed the shaft-house November 13, 1903, the opening of ground in this portion of the mine was greatly delayed. Operations were not resumed until November 4, 1904. At present four drills are in service in No. 3 shaft, one sinking and three stopping and drifting. The new shaft rock-house is 32 by 40 ft. in size, having room for two 18 by 36 in. rock-breakers and one with jaws 12 by 24 in. The smaller and one of the larger breakers are installed. A Nordberg Cor-



liss engine with 12-in. cylinder and 24-in. stroke run the machinery. The old hoist at No. 1 shaft has been replaced by a high-duty Nordberg engine, and it will be moved to No. 3.

**Duluth.**

Jan. 16.

The resumption of operations at the Minnesota hard ore mines at Soudan has been announced. The mines have been kept free from water for the past year, and were ready for work in a very few days. They will produce a good grade of non-bessemer ore that is mostly crushed before shipment, except such as is wanted for lump use in open hearth furnaces. The mines, when active, employ about 400 men. Resumption at these properties starts everything on the Vermillion range. As these mines were almost the sole support of the towns of Tower and Soudan, there is great rejoicing.

A good many other lake mines, most of them the property of the Oliver Iron Mining Co., will resume shortly, in addition to the many whose intended activity has already been referred to. These include the Riverton and Dober, one of which is being unwatered, and the other prepared for mining; the Cundy, which is to be unwatered at once and will employ about 170 men; the Hiawatha, which is now full of water, but can mine a good deal of ore when once made ready, and some others. The Youngs mine, a new property of the Menominee range, is to begin hoisting ore at once, after two years spent in exploration and development underground. It carries a parallel lense to that of the Baltic.

The adjustment of wages by the Oliver Iron Mining Co. is being followed by similar changes at other mines, and the whole district is falling into line at the advanced rate. It was necessary to make these changes, even if mining men had not considered it due the men, which they did, and which was the first impelling cause of a readjustment. The company closed an order for fourteen 90-ton shovels for Mesabi range use, from the Bucyrus Works, to be delivered in the spring. Eight of these were ordered some weeks ago, the rest now. Eight will go to Hibbing district and the rest to Mountain Iron and Virginia. The company also ordered several locomotives for mine pit work, and 100 large standard gauge stripping cars. It proposes in future to carry on much of its stripping work on the Mesabi and elsewhere without the assistance of contracting firms, and this order is in part for that work. The shovels are all large and powerful, and will go to sections where the company has a large amount of development work in hand for the coming season.

E. J. Longyear, a leading exploring contractor of the Mesabi range and other parts of the Lake Superior region, has 22 drills now at work on the Mesabi, and several elsewhere, including some at Baraboo. About this number has been maintained in instant operation through the recent dull times by him.

Shipments from Baraboo, from the Illinois mine of the International Harvester Co., have been, for 1904, 47,735 gross tons. Shipments at the regular rate of about 5,000 tons a month are maintained.

Explorations in the Deerwood district, west of Duluth, on the Northern Pacific road, are in progress by Cole & McDonald for the Mahoning Ore & Steel Co., which is the only heavy ore consuming concern at work there so far. Interests connected with fee ownership of land in that region state that several large con-

cerns are preparing to go in there, and are ready to pay bonuses for lands on which to explore. There are five or six drills in the region at this time.

All work of the International Iron Co., at the southern end of Hunter's island, Ontario, have ceased for the present, and will resume, the company states, in the spring. Discoveries there have not been important, but what has been found is not at all discouraging, it is claimed by those interested.

Nearly all stripping and surface development work on the Mesabi range has ceased for the winter, and the frost is now quite deep in ground that was not early protected by an ample covering of snow. With the cessation of this work, men employed thereat have gone into mines and the lumber woods, and the labor situation has remained unchanged. There are men enough to go around, with always some to spare, but good men are sought after and always keep their positions. There has been a sharp demand from old ranges, especially the Menominee, since winter set in, and the force employed there is increasing steadily. It was small, and even on January 1 Iron county reported only about 725 miners at work in the group of mines at Crystal falls and adjoining camps.

**Salt Lake City.**

Jan. 13.

The annual stockholders' meeting of the Yankee Consolidated Mining Co. is scheduled to occur on Jan. 23, at which a board of directors will be chosen. The report of the treasurer will show that on Jan. 1 the treasury contained a little more than \$73,000, against about \$10,000 at the same period a year ago. The company paid no dividends during 1904, but carried on an extensive campaign of development, with very satisfactory results. The mine will undoubtedly furnish dividends during the present year.

At a special stockholders' meeting of the Fish Springs Mining Co. the bond and lease issued to the Utah Mine Corporation by the directors was ratified. The bond calls for the payment of \$10,000, provided the Utah decides to purchase the property after a certain amount of development work is done, within two years. The Utah recently bonded the Galena property, adjoining, for \$20,000.

Samuel Newhouse may become managing director of the properties of the Majestic Copper Mining & Smelting Co., in Beaver county. After numerous conferences with President Mucklow, of the Majestic, who has been in Utah since before the holidays, Mr. Newhouse made a proposition, which is to be submitted to the directors of the company, with the endorsement of Mr. Mucklow, for consideration. The chief advisers of Mr. Newhouse recently made an exhaustive examination of the Majestic mines, and their reports were couched in the most favorable terms. It is believed here that a very close alliance between the Newhouse and Majestic companies will exist in the future; that in a little time the product of the Newhouse mill, which is nearing completion, will be reduced to matte at the Majestic smelter at Milford.

The annual stockholders' meeting of the Blackbird Copper Mining Co. will be held on January 24, for the election of a new board of directors. The property of the company is located adjoining the Cactus.

Dr. Franz Meyer, the well-known metallurgist, has undertaken the task of con-

ducting a series of tests, and, if possible, solving the smelter smoke problem in the Salt Lake valley, which is causing much contention with the farming element. In a statement made for the use of the JOURNAL Dr. Meyer says: "The situation which I find here is most complicated, and, consequently, as a problem to be solved, is greater and more difficult than any I have ever encountered heretofore. Not only is the quantity of ore smelted in this valley a very large one, but the quality of the ores to be treated varies so greatly that a great variety of metallurgical processes is used in their reduction by the different smelters. As these conditions naturally require a close study of the operations at each smelter, and of the gases given off, they necessitate a great deal of analytical and experimental work for ascertaining the nature of the smoke and for advising the best methods to make it harmless to vegetation.

"As I have just commenced my work, I am not yet in a position to say what can or should be done to remedy the trouble about which the farming population of this valley is now complaining. I am, however, obliged to say that I find the managers of the smelters quite willing in giving me every assistance which they possibly can in my efforts to collect the data on which I can form an opinion. I therefore feel justified in saying that I hope to find ways and means by which the situation will be materially improved. This, of course, takes time, but I can assure the people interested that my investigation will be a thorough and exhaustive one, and that on account of the experience I have had in this special line of metallurgy, both in this country and abroad, I am in a position to make practical suggestions, and should be thankful to parties interested in the solution of the problem for being patient."

A suit to quiet title to the Arley lode mining claim has been brought against the Columbus Consolidated Mining Co., operating at Alta, by Charles H. Cushing.

It is expected that the aerial tramway being built by the Continental Alta Mines Corporation is nearing completion, and the management will place it in commission about the middle of next month. The machinery of the Continental Alta's new mill was given a trial run during the week and the plant was turned over to the company by the contractor.

The Stockton Gold Mining & Milling Co. has experienced trouble in the operation of its new mill, owing to a scarcity of water, due to the unusually mild winter. The plant has been running about half capacity.

The Savanic copper mine, located in the extreme northwestern corner of Arizona, near the Utah State line, has been sold to Michigan parties by Col. H. L. Pickett, formerly of Salt Lake, but now of Tombstone, Arizona. The property has been productive of some very high-grade copper ore, 14 car-loads having been shipped to Salt Lake for treatment, which averaged 39 per cent. The property is to be equipped with a smelter, and connection will be made with the San Pedro, Los Angeles & Salt Lake railroad by wagon road to Moapa, Nevada.

It is reported on good authority that the Hidden Treasure mine in Dry Canyon, near Ophir, has been bonded to E. W. Clark, manager of the Ophir Hill Mining Co.

The Copper Belt railroad, of Bingham, is now in charge of the operating department of the Denver & Rio Grande railroad, the deal for the sale of the prop-

erty having been concluded during the present week.

The Kangaroo Mining Co., owner of the Nemesis lode mining claim, at Bingham, has brought suit in the State courts against the United States Mining Co., on the grounds of alleged unlawful extraction of ore of the value of \$100,000.

Toronto. Jan. 12.

A company is in process of organization to work the gold placer deposits on the Upper Vermilion river, north of Sudbury, by the system of gold dredging successfully practiced in California and New Zealand. The Gold Gravel Dredging Co. will shortly apply for incorporation under the laws of Ontario, with an authorized capital of \$500,000. The principal promoter is Robert H. Ahn, who has been engaged in prospecting and preliminary work in the locality for the last three years, and has made an exhaustive examination by means of test pits. As a result of these he reports that there is a large amount of ground that will yield 20 cents per cubic yard. He estimates that there are billions of yards of gravel that will yield a profit of 10 cents per cubic yard on treatment under improved modern methods. The feasibility of the proposition is confirmed by an official report of A. P. Coleman. The company has secured three alluvial gold gravel locations, in all about 500 acres, on the upper Vermilion, and expects to begin operations during the coming season with a \$50,000 dredge. So far the system has not been tried in Ontario with modern equipments, and should the project prove successful it will revolutionize the now somewhat discredited gold mining industry of the Province.

The Dominion government has paid out \$147,261 in coal oil bounties since June 8, 1904, which falls considerably short of the estimated amount. Claims to the amount of \$19,540 for bounty on pig iron production have been made by the Algoma Steel Co. of Sault Ste. Marie, on account of an output of 13,036 tons, during the two months ending Dec. 15.

The departments of geology and mineralogy in connection with Toronto University have occupied their new quarters in the Chemistry and Mining building just completed. The instructors in mineralogy, who have for some time been badly hampered for want of room, will now have ample space at their disposal.

A thriving quarrying industry is growing up in the Temiskaming district. New Liskeard is receiving many carloads of stone from the quarries near Haileybury, which will be in requisition for building next season.

The output of the Dominion Coal Co.'s mines in Nova Scotia for 1904 was 3,023,522 tons, the total shipments being 2,980,037 tons. At one of its collieries, the Hub, the output was comparatively small on account of the extensive construction work undertaken. Harrow work is being largely prosecuted in several mines to give ample room in anticipation of a larger output when navigation opens.

The Egg Lake Oil Co. has been incorporated, with headquarters at Edmonton, N. W. T., and a capital of \$100,000 to develop oil property in the Egg Lake district.

A number of Russian Finns recently landed have gone to Sudbury to work in the nickel-copper mines.

J. K. Rowell, director of the Lake Superior Corporation, of Sault Ste. Marie, reports to the Ontario government that the enterprise is flourishing financially. It pays out in wages between \$125,000 and \$150,000 per month, and has met the inter-

est both on the bonds guaranteed by the government and those issued on the credit of the company. The claims of those creditors who threatened litigation on account of delay in settling with them have been met. The blast furnace now at work producing pig iron has a capacity of 250 tons a day, and in a few days a charcoal furnace with a capacity of 150 tons daily will be in operation, when the total output of pig will do away with the necessity of importing pig iron from the United States.

Victoria. Jan. 15.

*The Coast.*—Last month's returns of the Tye Copper Co. show that 441 tons of matte were produced from 5,565 tons of ore treated, the gross value of which, deducting costs of refining and purchase of customs ore (846 tons), was \$63,883. A new sampling mill is now being installed at the smelter.

*Cariboo.*—J. D. Kendall, a consulting mining engineer of London, who recently inspected the Slough Creek, Ltd.'s deep level mine in this district, has been able to present a favorable report to his principals. He advises, however, that a considerable working capital be provided, of which \$25,000 should be at once devoted to further development work. As a result of Mr. Kendall's report a Glasgow syndicate has under contemplation the flotation of a new company, with a capital of £200,000, of which £50,000 is to be available for working capital, the present shareholders to receive £75,000 in shares in the new company as the purchase price of the property. It is pointed out that any further reconstruction of the old company is out of the question, as the original shareholders are not in a position to respond to heavy calls.

*Slocan.*—An extraordinary general meeting of shareholders of the Rambler-Cariboo Mines, Ltd., will be held in Kaslo on January 16 to consider a resolution to increase the nominal capital from \$1,250,000 to \$1,750,000, in order to provide additional funds for the completion of a long tunnel which is now being driven at the mine. It is proposed to first offer the new issue to shareholders at the rate of 12½ cents per share.

E. H. H. Holman, of Nelson, who acquired some weeks since a long lease of the Chapleau mine, on the north fork of Lemon creek, has shipped a small lot of ore to Rossland, in order that it may be subjected to test by the Elmore oil process. Should the ore prove amenable to the treatment, Mr. Holman intends to erect a plant at the mine. The ore is now being regularly shipped to the Trail smelter.

Arrangements have been completed for the resumption of operations at the Marion silver-lead mine, near New Denver.

It is not now considered likely that work at the Noble Five, at Cody, will be continued, James Dunsmuir, the owner, having last week taken out the compressor plant, which was shipped to Vancouver Island for use at the collieries.

*Nelson.*—Active development work is now well under way at the Mollie Gibson mine, where three tunnels are being driven, one upon the Aspen and two upon the Florence vein. Seventy-five tons of ore taken out in the course of development has just been shipped to the smelter. Directly conditions warrant, a concentrator will be erected at the property.

London. Jan. 7.

Your British Columbia correspondent reported some six months ago that the Elmore oil concentration plant had been

shut down at Le Roi No. 2. The consulting engineers, Alexander Hill and Stewart, have now issued a statement relating to the operation of the process. During the time the plant was running, from October, 1903, to May, 1904, there were treated by the oil process 4,578 tons of tailing, averaging 0.107 oz. of gold, 0.227 oz. silver and 0.394 per cent copper, having a gross assay value of \$3.23 per ton. Concentrate amounting to 136¾ tons was obtained, averaging 1.129 oz. gold, 3.244 oz. silver and 6.532 per cent copper, having a gross assay value of \$40.35 per ton. The final tailing averaged 0.076 oz. gold, 0.135 oz. silver and 0.206 per cent of copper, equal to \$2.10 per ton.

It should be remembered that the tailing treated by the Elmore process had previously been treated by the Wilfley tables. During the year, from Oct. 1, 1903, to Sept. 30, 1904, these tables ran regularly and treated 11,601 tons of ore, averaging 0.191 oz. gold, 0.279 oz. silver and 0.522 per cent copper, or \$5.25 per ton. Concentrate having an average assay value of \$48.57 was obtained, and the tailing averaged \$3.23. Some of this, as already mentioned, was treated by the Elmore process. It will be observed from these figures that the recovery on Wilfleys was \$2.02 per ton, and by the Elmore process \$1.13 per ton, so that \$2.10 was not recovered. The consulting engineers, finding that so little could be recovered by oil concentration, abandoned it, and devoted their attention to the improvement of the water concentration. At the present time, the proportion of values recovered on the Wilfleys has increased so that a dollar more is recovered. Messrs. Hill and Stewart mention the cost of consumption of oil and finer grinding as economic points that have to be considered in connection with oil concentration. Although the first two items were susceptible of considerable economies while the plant was running, the expenses continued to be above the income. The publication of the report has been received with considerable interest in London, where the fortunes of the oil process are keenly followed. The results obtained at Col. R. M. Thompson's Canadian mines are looked forward to with some anxiety.

The Capillitas Copper Co., Ltd., which was floated three years ago to acquire old mines in the province of Catamarca, Argentine Republic, finds it necessary to raise additional capital. When the company was floated, I mentioned in these columns that the working capital provided (£100,000) hardly seemed sufficient for the purposes required. The mines are 35 miles from the smelters, and the distance could only be traveled by mules; so that an aerial ropeway had to be built. In addition, large sums of money were required to put the mines in proper shape for systematic work, and the smelters also had to be practically rebuilt. It is, therefore, not surprising to find that the capital subscribed has all been spent, and that £60,000 is wanted to complete the work. At the present time, the aerial ropeway is half finished, and the smelters have not had much attention given to them. The directors originally counted on being able to keep the mines and smelters going by shipping ore on mule-back to the smelters; but, unfortunately, mules were scarce, so smelting has had to be entirely suspended. Just how the money is to be raised is not quite clear, for the proposals of the directors to issue debenture bonds exchangeable into preference shares, has not met with unanimous approval. I ought to mention that the direction of the company is in excellent hands. The firm of Chap-



lin, Milne, Grenfell & Co. are interested in the company, as also is Mr. Nicol Brown. The difficulties encountered are entirely due to the directors and engineers having no practical experience of South American conditions.

#### Johannesburg Dec. 19.

The large increase in the gold output for November is probably the principal cause of the rather buoyant market. The present is an excellent time to bring out mining ventures, for people seem willing to buy anything. The gold output for 1904 will probably be the largest yet recorded. By the end of the year there will be about 23,000 Chinese coolies at work on the Rand. Recruiting in China is being pushed, so that next year the gold output will be very much increased, for our labor supply will be greater by many thousands. Just how many unskilled workmen the Rand can absorb, it is difficult to say; the tendency is to underestimate the number. If cheap labor is abundant, rock-drilling by machines in stopes will be replaced by hand-drilling. There are mines on the Rand with thin reefs, which can only run at a profit when the rock in stopes is broken by hand-labor.

The local press made a great fuss over a fight which occurred last Sunday between Chinese and Kaffirs, in which three Chinamen and one Kaffir were killed and many wounded. It was a serious affair, no doubt, but it is well to recall pre-war days on such occasions. I remember in 1897-98 what terrible rows occurred nearly every Sunday between Kaffirs working on different mines. Quite a number of black men were killed on these occasions, but the mining industry went on just the same. The row last Sunday does not prove the Chinese a failure.

The question of supplying the Chinese coolies with vegetables is being met in different ways. Some mines buy vegetables for 12 shillings per hundred pounds from contractors, while others have put farms under cultivation and grow enough produce to supply their Chinese workmen. Some mines are able to show as much as £80 profit per month by growing their own vegetables.

Work on the electric street tram-line is going on. An important proposition has been made regarding the railway along the reef. It is proposed to substitute electric traction for the present steam traction, from Springs to Randfontein, a distance of 57 miles. This will be a blessing to people living on the mines, and will greatly aid in getting thousands of the population of Johannesburg to build homes along the route. Even with the present slow, unsatisfactory steam service, the tendency for people to have homes in the country and their business in the city is marked. At Florida, a small suburb 10 or 12 miles from Johannesburg, a number of residences are going up. Spreading the population is the surest way of reducing rents. It is proposed to put the power house for the new scheme at Germiston, the half-way house. If it is ever decided to have electric traction between Johannesburg and Pretoria, this central power-house at Germiston will answer for both lines.

That exile, Paul Kruger, has at last reached his old home. The great Boer has been buried at the capital he was so proud of. Nothing but good taste marked the ceremonies. Every respect was shown by the people of Johannesburg for their old enemy. Not a trace of spite or enmity could be found.

#### Personal.

Mining and metallurgical engineers are invited to keep THE ENGINEERING AND MINING JOURNAL informed of their movements and appointments.

Mr. Henry Janin is in London.

Mr. E. G. Spilsbury has returned from Utah.

Mr. F. Johnson has returned from Brazil.

Mr. R. J. Frecheville is at Parral, Mexico.

Mr. Donald P. Gillies is seriously ill at Los Angeles, California.

Mr. Llewellyn E. Humphreys, of Denver, is visiting New York.

Mr. Vance Carothers is engaged in professional work in Arizona.

Mr. Leo Von Rosenberg, of New York, has gone to Cripple Creek, Colorado.

Mr. Edward I. Field is manager of the United Elkhorn mines, in Eastern Oregon.

Mr. R. N. Bishop has been appointed manager of the Greenback mine in Oregon.

Mr. Fred G. Farish, of Denver, is examining mines near Rosario, in Sinaloa, Mexico.

Mr. R. B. Brinsmade has resigned his position with the Semet-Solvay Coke Company.

Mr. Roscoe H. Channing, of the Utah Consolidated company, is visiting New York.

Mr. Edward S. Dorman, of Missoula, Mont., is in New York on professional business.

Mr. F. W. Hoar has returned to El Paso, after examining copper mines in Arizona.

Mr. L. C. Parker is manager for the New York-Montana company, at Coloma, Montana.

Mr. Jesse J. May has been appointed manager of the Newhouse Tunnel Co. in Colorado.

Mr. J. A. Balch has been appointed superintendent for the Mountain Copper Co., at Keswick, Cal.

Mr. H. C. Bellinger is acting as consulting metallurgist to the United States Mining Co., Utah.

Mr. Percy Williams has been appointed chief engineer for the United States Mining Company in Utah.

Mr. J. D. Robertson is superintendent of the Guadalupe mines at Villaldama, in Nuevo Leon, Mexico.

Mr. Rupert C. Alabaster is employed at the smelter of the Copper Queen Mining Co., at Bisbee Arizona.

Mr. William J. Cox, manager of the Camp Bird mine, Colorado, has left New York on his return home.

Mr. P. L. Young has returned to California from Mexico, where he had been investigating mining properties.

Mr. Edgar J. Strasburger has returned to Butte, Montana, from Cerro de Pasco mines in Peru, South America.

Mr. Chester W. Brown, manager for the Inca Mining Co., of Peru, has been visiting at Los Angeles, California.

Mr. Frank L. Whipple has been appointed superintendent of the Federal Loan mine at Nevada City, California.

Mr. D. E. Owen, superintendent for the Davis Mining Co. at Parral, Mex., has returned from a visit to this country.

Mr. Edward Moore has been appointed assistant superintendent of the upper mills of the Carnegie Steel Co., at Youngstown, Ohio.

Mr. Herbert Martin, of Stockholm, Sweden, is visiting Western mining fields, making examinations of large power plant applications.

Mr. Walter Joy, formerly assayer and chemist for the Kittie Burton Gold Mines Co., at Ulysses, Idaho, is now at Las Vegas, Nevada.

Mr. Henry C. Mortimer, Jr., has joined the New York office staff of the Crocker-Wheeler Co. He will act as assistant to the manager.

Mr. George S. Ramsay has been appointed general superintendent of mines to the Shawmut Mining Co., at St. Marys, Pennsylvania.

Mr. Richard A. Fitz-Gibbon, secretary and treasurer for the Mexican Standard Mining Co., of Parral, Mexico, has been in New York.

Mr. H. B. Sturtevant has resigned as manager of mines for the Buffalo & Susquehanna Iron Co. and the Iroquois Iron Co. in Minnesota.

Mr. A. S. Haskell is superintending the construction of the new plant of the Mountain Copper Co., at Bull's Head Point, near San Francisco.

Mr. W. S. Dillon, general manager for the American Mexico Mining & Development Co., of Torreon, Mexico, has been visiting at Hazlehurst, Mississippi.

Mr. Frank W. Hopkins has resigned as general manager of the Colorado Iron Works to take charge of the Taylor Engineering Co.'s works in New York.

Mr. Cary W. Thompson has resigned as manager of the Greenback mine at Greenback, Ore., and will make mine examinations his specialty at Portland, Oregon.

Mr. M. K. Rodgers, of the Daly Reduction Co., of Montana, is now in Ashcroft, B. C., arranging for opening the Maggie group of mineral claims on the Bonaparte river.

Mr. J. A. Ede, of La Salle, superintendent of mines for the Illinois Zinc Co., is at Joplin, Mo. Mr. Ede has been appointed consulting engineer for the Symmes Coal Company.

Mr. L. S. Wood has resigned as manager for the Ashanti Gold Fields Corporation, Ltd., Obuassi, Gold Coast Colony, West Africa, and returned to Denver, Colorado.

Mr. Willard Bayliss has been appointed manager of the Myers and St. Clair mines in Minnesota. He was formerly engineer for the Oliver Iron Mining Co., on the Gogebic range.

The firm of Burger & Siebert has been dissolved. The consulting engineerships and other business of the firm will be continued by C. C. Burger, with offices in New York, as before.

Mr. Charles R. Claghorn has been appointed manager of the mining properties of the Northern Pacific Railway Co., to succeed Mr. Harry Horn, who has been made general manager.

Mr. W. H. Dudley has resigned as secretary of the Anaconda Copper Mining Co., of Anaconda, Montana. He has accepted a general position with a railroad company in Mexico.

Mr. John Williams has resigned his position as consulting engineer to the Ladd Metals Co., at Mineral, Idaho, and has been appointed manager of the Wood River Zinc Co., at Hailey, Idaho.

Mr. Horace F. Brown has returned to San Francisco from Pittsburg, where he has been conducting a series of experiments on the agglutination of dust from iron furnaces and ores.

### Obituary.

A volume has been prepared containing biographical and memorial notes on the late Jacob O. Hamberger, former editor of the Leadville (Colo.) *Herald Democrat*, and for several years the Leadville correspondent for the *JOURNAL*. The work is of great artistic merit; it contains an excellent portrait of Mr. Hamberger.

### Societies and Technical Schools.

*Rensselaer Polytechnic Institute.*—Mr. W. A. Riebling of Newark, N. J., has given \$10,000 to this institution, at Troy, N. Y., to be used in replacing the building recently burned. A gift of \$5,000 is also announced from Mr. George B. Cluett.

*Franklin Institute.*—The following are the new officers of this association elected at the annual meeting on January 18: President, John Birkinbine; vice-president, Washington Jones; secretary, William H. Wahl; treasurer, Samuel Sartain; auditor, William H. Greene; managers, Edwin H. Balch, Walton Clark, Thomas P. Conard, Chas. Henry Howson, Louis E. Levy, Chas. Longstreth, Isaac Norris and Coleman Sellers.

*Society of Chemical Industry.*—At the meeting of the New York section on Jan. 20 the following papers will be read: 'Quick Process of Tanning Sole Leather,' by Alan A. Claffin; 'The Preparation of Volumetric Solutions,' by Edward C. Worden and John Motion; 'Standard Methods of Sampling,' by Martin L. Griffin.

*Lehigh University.*—This institution, at South Bethlehem, Pa., has issued a 32-page pamphlet describing its four-year course in mining engineering. A course in this subject has been offered continuously since the founding of the university, and nearly 20 per cent of the graduates have taken this course or the allied course in metallurgy. The studies offered represent a combination of literary, technical, scientific and engineering subjects. They include English, with essays and public speaking, German or French, an opportunity to take Spanish, advanced algebra, trigonometry, mechanics, analytic geometry, calculus, physics, electricity, political economy, physical culture, chemistry, qualitative and quantitative analysis, ore analysis, blowpipe analysis, crystallography, mineralogy, petrology, lithology, geology, including economic and field geology, boilers and steam-engines, with experiments in the engineering laboratory. The graduates of this course hold responsible professional positions in this and many foreign countries.

### Trade Catalogues.

The Westinghouse Electric & Manufacturing Co., of Pittsburg, describes in Circular No. 1096 its well-known oil switches and oil circuit breakers.

Bulletin No. 1060 of the Fort Wayne Electric Works, Fort Wayne, Ind., is given up to a description of the company's portable wattmeter calibrators.

The Scully Steel & Iron Co., of Chicago, is sending out its stock list for January and February. Buyers will find it a valuable compendium for their needs.

Ryerson's *Monthly Journal and Stock-list* for January, issued by Joseph T. Ryerson & Son, of Chicago, has been received.

It contains the usual lists of the specialties carried by this company.

Picher sublimed white lead is the subject of an artistic little book prepared by the Picher Lead Co., of Joplin, Mo. It contains the story of the discovery of the process of subliming white lead, and much other interesting information.

The Cooper-Hewitt Electric Co., of New York, has in its bulletin No. 5 described the Cooper-Hewitt mercury vapor electric lamp for direct-current lighting-circuit only. The utility of this lamp for many purposes is shown, and convincing tests of its efficiency are given.

The Smooth-On Manufacturing Co., of Jersey City, is sending out a convenient little pocket-book which contains a piece of Smooth-On iron cement sheet-packing and a magnet. One of these pocket-books will be sent free to any engineer upon receipt of five cents for postage.

The Ingersoll-Sergeant Drill Co., of New York, devotes its handsome catalogue No. 52 to a description of its coal-mining machinery, including coal-cutters, coal and rock drills, air compressors and equipments. The book is handsomely illustrated and has a great deal of artistic merit. The same company, in Form 35, has issued an equally handsome catalogue of air compressors.

### Industrial.

The Bristol Co., of Waterbury, Conn., has been awarded a gold medal for its recording instruments, by the St. Louis Exposition.

The style of the firm of Charleton & Co. has been changed to Charleton, Dickinson & Co., with offices, as heretofore, at 11 Queen Victoria street, London.

Alfred H. Schütte, of Cologne, Germany, dealer in machinery and tools, announces he will continue under his own name the business formerly conducted as Schuchardt & Schütte.

The Isthmian Canal Commission announces that proposals will be received calling for machine tools, machinery, hand cars, leather belting rope, canvas and rubber hose, cars and miscellaneous supplies, to be used in the construction of the Panama Canal. Communications may be addressed to the Isthmian Canal Commission at Washington, D. C.

The Colorado Iron Works Co., of Denver, Colorado, reports the following orders: Eight (100 cu. ft. capacity) ore cars for the Cananea Consolidated Copper Co., in Mexico; 6 (17 ft. diam.) Hendryx agitators for the Liberty Bell Mining & Milling Co., in Colorado; one set of 40 in. by 16 in. improved standard, wide faced, and two sets of 30 in. by 10 in. improved standard, narrow faced fine crushing rolls, for El Cobra Mining Co., in Cuba; also six single three-compartment Colorado Iron Works jigs for the same company; four Colorado Iron Works impact screens for the Cripple Creek-Homestake M. & L. Co., and a shipment of ore cars, etc., to the London Mining Co., both in Colorado.

The Westinghouse Electric & Manufacturing Co. has closed a contract with the Ontario Power Co. for an alternating current generator, with a rated output of 10,000 h.p. at 85 per cent power factor. This is in addition to three other machines of similar type which the Westinghouse company is furnishing for this plant. The generators are of the revolving-field, two-bearing type, designed for direct connection to water-wheels; they generate three-phase current at 12,000 volts and 25 cycles,

and run at a speed of 187½ r.p.m. Among other apparatus included in the contracts are twelve 3,000-kw. oil-insulated, water-cooled transformers, wound for 12,000 and 60,000 volts; two 375-kw. exciters, and complete switchboards. Messrs. P. N. Nunn and L. L. Nunn are engineers in charge, and the plant is being built by the Niagara Construction Co., of which Gen. Francis V. Greene is president.

When the gases pass through an economizer containing pipes arranged longitudinally in straight rows, with intervening straight, free, air spaces, they do not come into contact with a large part of each pipe; in other words, they are not sufficiently agitated by the pipes. In fact, there is always a considerable amount of gas which passes quickly through the openings between the rows of pipes, without giving up any appreciable heat, until it joins with the colder gases at the economizer outlet. The patent arrangement of 'staggered' pipes in the Sturtevant economizers, in which the several sections are so arranged that the pipes of any one section stand longitudinally opposite the spaces between the pipes of adjoining sections overcomes this loss of heat. With this arrangement the gases are agitated and come into contact with a maximum area of the economizer pipes, utilizing a maximum amount of the waste heat from the boiler.

The S. H. Supply Company, of Denver, on Feb. 1 will occupy the building at 18th and Lawrence streets, Denver, formerly used as the central power station of the Tramway company, fronting 200 ft. on Lawrence street and 125 on 18th street. This is one of the largest buildings in the city, and will be occupied entirely by this firm as display room for machinery and supplies and offices of the company. The location is excellent for the business, being in close proximity to the leading hotels and office buildings. The company shipped and received 528 carloads in 1904, and the sales amounted to nearly double that of 1903. At 31st street it occupies over 20 acres of yard room, four warehouses, and has over a mile of trackage. At this place is located its tank factory for the manufacture of wood tanks for water storage and cyanide work. The company's foreign business is constantly growing. Carload shipments in one month recently went to Nova Scotia, Kentucky, California, British Columbia and Mexico.

The Hamilton Cataract Power, Light & Traction Co. has recently started the two 5,000-kw. Westinghouse generator in their De Cew Falls power station in Ontario. Power is supplied from Welland Canal feeders, tapped in about 14 miles above the power station, and at the station the water has a head of 267 feet. The Westinghouse generators are of the two-bearing type, direct connected to Escher-Wyss water-wheels, and run at a speed of 286 r. p. m. They generate 3-phase current at a frequency of 66 cycles, and a pressure of 2,400 volts. The power is transmitted to the city of Hamilton, Ontario, where it is used for lighting, street railway and manufacturing purposes. A reserve steam-driven station is located at Hamilton, which contains two 1,000-kilowatt Westinghouse generators. The entire station and high-tension apparatus are of Westinghouse design. The company has two separate 3-phase transmission lines to Hamilton, a distance of about 35 miles. The high-tension apparatus is designed for a pressure of 40,000 volts, but will be operated for a time at 20,000 volts. Wm. C. Hawkins is general manager of the Hamilton Company, and is also engineer in charge of the installation.



## General Mining News.

**Mineral Oil Exports.**—In the year 1904 exports of mineral oils from the United States were, as below, in gallons, comparison being made with 1903:

	1903.	1904.
Crude.....	121,984,693	95,974,645
Naphthas.....	11,664,586	22,837,347
Illuminating.....	672,298,439	745,742,071
Lubricating and paraffin..	93,513,890	87,439,482
Residuum.....	8,835,963	33,736,412
Totals.....	908,297,571	985,729,957

The increase in 1904, equivalent to 77,432,386 gals., or 8%, is credited principally to illuminating oil and residuum sent largely to Germany and France.

## ARIZONA.

## GILA COUNTY.

**Arizona Commercial Co.**—This company has been organized with a capital of \$1,000,000 to operate properties adjoining the Old Dominion at Globe. A narrow-gauge railroad will be built one and one-half miles in length, to connect the property with the Gila Valley, Globe & Northern & Old Dominion railroads.

## GRAHAM COUNTY.

**Arizona Copper Co.**—This company reports that the production of its mines and works at Clifton, for the month of December was 1,228 short tons of copper.

## MOHAVE COUNTY.

**Paymaster.**—This group near Cerbat has been purchased by the Victor Paymaster Mining Co. for a reported price of \$30,000. The company is composed chiefly of Los Angeles business men and capitalists.

**Quartette.**—It is reported that this mine near Kingman paid a dividend of \$20,000 in January. The money hitherto taken from this mine has been spent in betterments. Much valuable ore is said to be blocked out.

## PINAL COUNTY.

**Ray.**—It is reported that work will soon be resumed on this mine.

**Development Company of America.**—This company, holding large interests in several properties in this county, has elected the following directors: B. P. Cheney, Boston; Rutherford Trowbridge, New Haven; E. B. Gage, Tombstone, Ariz.; John Hartsler, Lancaster, Pa.; W. B. Paxson, Philadelphia; Richard Gentry, Kansas City; Selwin Eddy, San Francisco; H. M. Robinson, Youngstown, Ohio; F. M. Murphy, Prescott, Ariz.; Temple E. Dorr, Saginaw, Mich.; Henry Wick, Youngstown, Ohio; Zeros L. Wolcott, Dover, Del.; W. H. Steyton, C. A. Griscom, Jr., and V. L. Mason, of New York.

## YAVAPAI COUNTY.

**Buffalo Arizona Gold Mines Co.**—This company, which owns property in the Turkey Creek district, is doing considerable development work in addition to acquiring other claims. The ore is said to show good values in gold and silver with indications of copper.

**Good Hope.**—A good strike is reported to have been made at this mine owned by James Chambers. The property is about 12 miles south of Prescott.

**Old Mesa Gold Co.**—At this company's property near Poland, very satisfactory results are reported to have been obtained in recent operations.

**Val Verde.**—It is reported that plans

for the construction of a new smelter on the site of the old plant at Val Verde are practically completed. Its size is still uncertain, though it is not likely to be smaller than 500 tons daily capacity.

## CALIFORNIA.

## AMADOR COUNTY.

**Stewart.**—J. R. Stewart has applied for a permit to hydraulic at this mine, near Oleta, draining into Indian creek, which reaches the Cosumnes river. The Gold Top Mining Co. has also applied for a hydraulic license to work the Orchard claim, near Pine Grove, draining into Jackson creek, which reaches the Mokelumne river.

## CALAVERAS COUNTY.

**Outlook Mining Co.**—This is the name of the reorganized Emma Mining Co., or so-called Easy Bird mine, which has set men at work putting the mine and 10-stamp mill in readiness for work. W. T. Robinson, of Mokelumne hill, is superintendent, and A. E. Moyer, of Boston, Mass., is financial agent.

## CONTRA COSTA COUNTY.

**Mountain Copper Co.**—This company, owning the extensive mines and smelters in Shasta county, has started in improving its land at Bull's Head Point, on Suisun bay, about 100 men being engaged in grading, etc., getting ready for the new buildings to be erected for the smelting or refining plant.

## EL DORADO COUNTY.

**River Hill.**—This mine is one and one-half miles from Placerville, in the characteristic gray and black slate of this section. It is under the management of Thos. Clark, who has developed the two main parallel veins to a depth of 1,000 ft. The shaft sinks between the veins, with cross-cuts running to the two orebodies. The gangue is a laminated quartz and slate. Mr. Clark states that he is mining and milling 80 tons per day, the mill having 20 stamps, with amalgamating plates, followed by Wilfley tables. A fine pyritic concentrate is recovered by the tables.

**Landecker.**—This is a gravel mine on Weber creek, near Placerville, and belongs to a Pennsylvania company. Clyde Jackson is manager, with H. C. Plummer as superintendent. A mill of the Krough type handles 100 tons per day; its work is to break up the cemented gravel and screen it. The values, amounting to about \$4 per ton, are recovered in amalgamating riffles.

**Ida Mitchell.**—This mine is at Placerville and has been opened by a 500-ft. incline in the slate hanging-wall, the foot-wall being greenstone. Cross-cuts are being run to parallel veins. The property belongs to a Pennsylvania company and is managed by Clyde Jackson.

## FRESNO COUNTY.

**Associated Oil Co.**—In pursuance of its policy in controlling the fuel oil of the Coalinga field, this company has acquired the West End, or McNear pipe line, connecting certain important wells with the Ora shipping station.

## INYO COUNTY.

**Southern Belle.**—This group, at Laws, eight miles from Bishop, is again being actively and profitably worked.

## KERN COUNTY.

**Best.**—This mine, at White river, has been bonded to G. S. Berry, of Lindsay, who will now develop it.

**Old Keyes.**—The Stavert Bros. are running a drainage tunnel in this mine, at Isabella, which is to drain it 150 ft. below the deepest working and 800 ft. below the deepest part of their ground.

## MONO COUNTY.

**Crystal Lake Mining Co.**—A good body of ore has been opened up in the new tunnel of this property, at Lundy, and the mill will shortly be started up.

## PLACER COUNTY.

**Independence.**—W. & G. Carpenter and V. Henderson have applied to the California Debris Commission for a permit to hydraulic this mine, near Iowa Hill, the drainage being into Independence creek, reaching the north fork of the American river.

## RIVERSIDE COUNTY.

**Menifee.**—A new company started work in this old mine, at Menifee, recently, and a hoist has just been set up at the new shaft.

## SACRAMENTO COUNTY.

**Ashburton Mining Co.**—The company has 310 acres at Sailor bar, near Fair Oaks, and a considerable area at Folsom, all of which is auriferous, gravel land, on American river. It is a Boston company, of which Bulkley Wells is president; R. L. Agassiz, secretary, with R. E. Cranston, of Sacramento, as manager. One dredge is operating at Fair Oaks, handling 3,000 yards per day. This dredge cost \$100,000, and a second dredge of the same capacity is to be built.

## SAN DIEGO COUNTY.

**High Peak Mining Co.**—The Elevada quartz mill is being moved to this mine, near Julian. A new double-compartment shaft is being sunk.

## SHASTA COUNTY.

**Clara.**—At this mine, near Keswick, Mr. Kahny, the new owner, is installing machinery. The mine has not been worked for the past four years, but will now be developed.

**Copper King.**—A despatch from London states that a decision of the King's Bench Division of the High Court of Justice debars American creditors from recovering debts from shareholders of British companies doing business in America. The question arose through a suit of the Risdon Iron Works Co., which sought to recover from Sir Christopher Furness as a shareholder of the Copper King, Ltd., now liquidating the cost of work supplied to the latter company in California. The plaintiffs contended that, as the Copper King Co. did business in California, the shareholders were amenable to the California laws, and therefore liable for the company's debts. The court held that the Copper King was an English company, and that the liability of the shareholders was limited to paying in full for their shares.

## SIERRA COUNTY.

**Rainbow.**—In this mine, Alleghany, James Clinton superintendent, a ledge has been found carrying free gold and rich sulphurets.

**Eastern Cross.**—This mine, near Alleghany, is to be opened up by Bovee Brothers.

**Council Hill.**—J. F. Schindler has applied for a license to hydraulic at this mine, near Scales, which drains into Rock creek, finally reaching the Yuba river.

**Alaska.**—This mine, at Pike City, is to be reopened in a systematic manner. The

450-ft. shaft is to be retimbered, and the old drain tunnel is to be extended. There has always been a heavy flow of water in this mine, giving much trouble, and new and heavy machinery is to be put in to handle it.

## SISKIYOU COUNTY.

*Sundown Mining & Milling Co.*—This company has paid off a \$20,000 bond on a number of claims near Gottville. The claims have been prospected to the satisfaction of the company, which has had them under bond for some time.

## TUOLUMNE COUNTY.

B. G. Smith and S. H. Robinson, of Columbia, have applied for a permit to hydraulic the Celtic and Monterey gravel mine, drainage into Mormon creek, which reaches the Stanislaus river. V. F. and J. Dondero, of the same place, have also applied for a permit to hydraulic the Gold Nugget mine, draining into Woods' creek, which reaches the Tuolumne river.

## YUBA COUNTY.

*Blue Point.*—The Campbell, or Blue Point ditch, which runs from near Grass Valley, Nevada county, to Smartsville, is to be reopened by Jacob Weisbein and the water carried to Blue Point. The ditch has not been used for some years. It will be straightened and will deliver the water at 400 ft. head.

*Marysville Gold Dredging Co.*—The company, recently organized, has 1,300 acres of auriferous dredging ground on the south side of the Yuba river, eight miles from Marysville. It adjoins the 3,000 acres that belong to W. P. Hammon and associates. This ground is stated to be 60 ft. deep, from surface to the false bedrock, the values being mainly in the lower 20 ft.

## COLORADO.

## BOULDER COUNTY.

The completion of the Eldora branch of the Colorado & Northwestern railway from Sunset to Eldora, a distance of 33 miles, means increased production from the Sugar Loaf, Nederland, Caribou, Magnolia, Eldora and other sections of the southern end of Boulder county. Already low rates have been made by the Colorado & Northwestern road, and shipments have been begun, there being a difference of from three to five dollars per ton, as against former shipping.

*Mogul Tunnel.*—Operations have been resumed at this property at Eldora; the tunnel company will employ a good number of men, while other companies will resume work on their properties through this tunnel.

*Mahan Gold Mining Co.*—The main shaft at this property is down nearly 250 ft., and five feet of smelting ore reported to be worth \$20 per ton, has been opened up, with a smelting streak of high grade ores, and the property is figured as a producer during the early part of the year. John Rice, of Ward, is manager.

*Alumnia Clay Co.*—This company, incorporated with a capital stock of \$1,000,000, has taken over the properties of the Cresta Clay Co. and the Great Western Brick, Tile & Pottery Co. The new company controls large deposits of clay, and will engage largely in the manufacture of clay products of a superior quality.

*Good Morning Gold Mining & Irrigation Co.*—Fred G. Shaffner has deeded to this company the Cuba, War Eagle and other claims in the Sugar Loaf district

for a consideration of \$12,000, and active development of the property has been begun with eastern capital.

## CLEAR CREEK COUNTY.

*Refugee.*—This property, in Hukill gulch, has been sold to Denver capitalists for a consideration of \$20,000, a shaft building is being erected, and a gasoline hoisting plant is to be installed. The main shaft is down 290 ft. and is to be sunk further. The property adjoins the Shafter mine.

*Dives-Pelican.*—A new 300-h.p. Rand Imperial type No. 10 compressor, one of the largest installed in northern Colorado, has been set in place, and the new compressor plant is reported to be doing splendid work. A large milling plant will be erected at the mouth of the Burleigh tunnel, and the properties will probably figure among the largest producers of the county in 1905. Joseph H. Eaton, of Silver Plume, is manager.

*Arapahoe.*—A streak of ore has been opened in the upper workings carrying values of 501 oz. gold and 4,376 oz. silver to the ton, or a value of about \$12,000 to the ton. J. J. White and others, of Georgetown, are the owners, and they have a group of 15 claims.

*Waldorf.*—At a distance in of 3,700 ft. in the Wilcox tunnel a good vein has been cut, being from five to six feet wide and showing a mineral streak of copper pyrites about 20 in. wide, tests showing values of five and one-half ounces gold, 128 oz. silver and 40 per cent copper. Machinery is being installed at the Wilcox, Kitty Ousely and Tobin tunnels, to be operated by machinery, and in addition to the concentrating mill at the Stevens mine, it is reported that at least one new mill will be erected to treat the large orebodies of concentrating ore which have been opened up by the past heavy developments. E. J. Wilcox, Georgetown, Colo., is manager.

*Red Oak Mining Co.*—A shipment made from the Sunburst claim of this property, near Georgetown, gave values of 380 oz. silver and 19 per cent lead. The streak is eight inches wide, alongside of which there are three feet of good quartz for milling.

*Humboldt.*—Local and Denver parties have taken a lease on this mine and mill, on Cascade creek, near Idaho Springs. Connections are to be made for ventilation by an upraise from the lower to the upper levels, and a number of leasers will be put to work. J. F. Puchert, of Idaho Springs, is in charge of operations.

*Yankee Consolidated.*—This company, operating in the Yankee district, has opened a four-foot vein of a first-class free-milling ore in its Faust tunnel, and developments under way at the Lombard-Polaris group have blocked out a large amount of ore reserves. The company is figuring on erecting a large shaft building over the shaft of the latter group, installing a large plant of machinery and air compressor, as well as equipment in the shape of a wire tramway from mines to mill. Henry I. Seemann, Denver, is manager.

## GILPIN COUNTY.

*Boston-Occidental Mining Co.*—This company, operating the Mascot, in the Pine Creek district, has opened up a body of ore carrying average values of \$17.20 to the ton in a cross-cut at a depth of 200 ft., and one streak showed values of as high as \$177 to the ton. The company has spent about \$50,000 in experi-

mental work at its test plant in Denver and experimental mill at American City, the latter being twice rebuilt. It has made numerous runs and claims to have obtained good results. Its process, it is claimed, is particularly adapted to sulphide ores, the process being dry crushing to 15-mesh, then wet concentration, and the company expects to cyanide its concentrate. Rolls for regrinding concentrates to a fine mesh are already installed, and the steel cyanide tanks are being built. C. S. Ripley, American City, Apex, Colo., is manager.

*Golden Rod Mining & Milling Co.*—This company, operating the Pet group, has added to its holdings the X group, comprising about 30 acres, the consideration being \$30,000. Shipments made from the Pet shaft to the smelters give returns of from \$38.45 to \$57.90 per ton, and it has considerable lower grade ores. The erection of its own mill on Silver creek is contemplated. John Lillig, Black Hawk, Colo., is manager.

*Imperial Mining & Milling Co.*—This company is shipping from two to three cars of smelting ores to Denver smelters, carrying values of from \$15 to as high as \$60 per ton, the product coming from the Mackey mine, and large bodies of milling ores to be treated at its own mill are being opened up. L. J. Mountz, Apex, is manager.

*Missouri & Colorado Milling & Mining Co.*—This company operates on the Snowdon group, on Silver creek, and is shipping smelting ores running about three ounces gold per ton in carload lots to Denver smelters. The company has experimented with cyanide, and is contemplating the erection of its own mill. W. C. Hollister, Apex, is manager.

*Cyrene.*—Operations are to be resumed at this property. The main shaft is down 200 ft., and machinery is to be installed. The property has produced some first class smelting ores. L. J. Mountz, Apex, Colo., is to be in charge.

## LAKE COUNTY—LEADVILLE.

*Fanchon-Tunnel.*—A contract has been let to drive this tunnel 2,600 ft. from the north side of Sugar Loaf mountain to the Fanchon vein. The tunnel will develop a number of claims on its trend as well as draining the hill, allowing other properties to be worked at greater depth. When the tunnel reaches the Fanchon it is the intention to drive it another 3,000 ft. to open the balance of the hill.

*Bessie Wilgus.*—Drifting under the ore body is the work that is being carried on at this property at present; this drift will prove the extent of the ore shoot.

*Rock Hill.*—This section of the camp is receiving a great deal of attention at present, and considerable work is being carried on at different properties. It is very probable that the Rock Hill Consolidated Co. will shortly begin extensive operations on the group of claims owned by it and which lies below the Reindeer. At present one of the shafts, the Moffat, is being worked in the upper levels, and a fair grade of ore is being shipped. It is the intention of the company to sink this shaft deeper and then drift south to catch the Reindeer shoot.

*Lecompton.*—A tunnel, now in 275 ft., is being driven on this property from the Iowa gulch side and has gone through 75 feet of ore, varying in thickness from four inches up to eight feet; the character of the ore is a hard carbonate and runs \$30 per ton. Shipments are being sent



out regularly to the smelter. The tunnel is being driven directly towards the Nisi Prius claim on Rock hill, and if the ore holds out, it will prove that the Rock hill ore shoots pass under Iowa gulch.

**Corona.**—This mine in California gulch, on the southern slope of Iron hill, has again resumed operations, and a very fair grade of lead ore is being shipped.

**Penrose.**—Excellent progress is being made in the sinking of this shaft, and little trouble is being experienced from water, as the bulk of it is caught and held at one of the stations. The shaft is in the lime, and another 100 feet will see it to the mineral.

**Amity.**—W. Hambelton and John Cassilly, leasing on this property, which is situated at St. Kevin, recently opened a body of ore in the shaft that runs from 300 to 400 oz. silver per ton, and carries about \$12 per ton in gold. The character of the ore is sulphurets, similar to that found in other mines in the district. During the summer a pocket of ore was taken out of this property that netted the leasors \$14,000.

#### ROUTT COUNTY.

**Hahn's Peak District.**—A sale of 25 lode claims on Farwell mountain, three miles east of Hahn's Peak, has been made to a syndicate of Denver and Eastern parties, the consideration being \$37,500. The group covers about 200 acres of the best mineral land of that section, and ores carrying values of as high as 50 per cent in copper besides fair gold values have been obtained. The remoteness from a railroad has kept back developments, but the new Moffat road will pass within easy distance of the property. A 100-ton concentrator is contemplated at the properties in the near future.

#### SUMMIT COUNTY.

**French Creek Gold Mining Co.**—Manager M. G. Evans, of Breckenridge, has given a contract for 1,000 ft. of crosscut tunnel work. The tunnel is in 400 ft. on Mount Baldy and electric power will be used in the work.

**Providence - Colorado.**—Development work on these holdings has disclosed large quantities of auriferous iron and lead ores and the company contemplates the erection of a concentration milling plant. H. S. Whitehead, Breckenridge, is manager.

#### IDAHO.

##### BANNOCK COUNTY.

**Inman Mining Co.**—Reports of a good strike on this company's property at Pocatello have been received.

**Williamsburg.**—Considerable activity is reported at this camp on the Salmon river. The camp is inaccessible, and although one of the richest in the State, is practically unknown. Among the properties are those owned by James Nolan, Williams Bros., and R. W. Woolard & Co.

##### ELMORE COUNTY.

**Jumbo.**—It is expected that a chlorination plant for treating the ores of this mine near Atlanta will be erected.

##### IDAHO COUNTY.

**Belle of Thunder Mountain Mining Co.**—It is reported that faults in the apparatus of the tramway are retarding the operations of the Sunnyside mill at Roosevelt. Work may be suspended until warmer weather.

**Dollar Bill Mining & Milling Co.**—This company has purchased the Oro and Denver claims at Hump. It is the intention

to start work on this claim early in the spring on an extensive scale.

**Jumbo.**—It is expected that a chlorination plant on this property at Hump will start working about the middle of this month.

#### LEMHI COUNTY.

**Grunter.**—An important strike is reported to have been made in the lower tunnel of this mine, near Shoup. The mines have been idle for many years.

#### SHOSHONE COUNTY.

**St. Louis-Idaho Mining Co.**—Development on this company's property near Burke is said to have given very favorable results. It is near the Hercules mine, and the tunnel of the Hercules can be used in developing the property.

#### WASHINGTON COUNTY.

**Ladd Metals Co.**—The improvements being made at this company's smelter at Landore are practically completed, and the plant will be blown in about Jan. 25. A blast furnace of 60 tons capacity has been installed.

**Iron Springs Consolidated Mining Co.**—This company has been formed, with a capital of \$5,000,000, to take over the Iron Springs, Pactolian and Holbrook mining companies, the Iron Mountain Mining & Reduction Co., and numerous other properties on Bear river and Bear creek in this county. The company is composed chiefly of Ohio and Pennsylvania capitalists.

#### INDIANA.

The largest deal in coal mining property ever consummated in the bituminous coal district of Indiana has been practically closed. Twelve or more big mines along the C. & E. I. and the E. & T. H. railroads have been acquired by the Bering Coal Company, of Chicago, a corporation chartered under the laws of Delaware, with a capitalization of \$5,000,000, and it is understood that the Frisco railroad system is really back of the deal. It is also understood that the block coal fields will be invaded in the near future, as well as other portions of the bituminous field. It is estimated that the entire number of mines already acquired will have an annual output of more than 7,000,000 tons of bituminous coal. The amount of money expended in this enterprise is not stated, but it is said that the amount is represented in its capitalization.

#### BARTHOLOMEW COUNTY.

**Progress Lead & Zinc Mining Co.**—This company has incorporated with a capital stock of \$150,000. The company will mine, quarry, mill, smelt, refine ores, metals and minerals of all kinds, particularly lead and zinc. The home office will be in Columbus, Ind., and the place of operation in Jasper county, Mo. Herman L. Rost, E. H. Godfrey, W. W. Adams, John L. Bonham and Martin Keller, incorporators.

#### BOONE COUNTY.

**Fishback Mining Co.**—This company has incorporated with the purpose of sinking shafts for the mining of coal, gold, silver, copper and other minerals. The initial capital stock is \$10,000. The principal office will be in Zionsville. Samuel B. Lane, Wm. Hendrick, James Lemon and others, incorporators.

#### VIGO COUNTY.

**Indiana-Oregon Mining Co.**—This company has incorporated with a capital stock of \$100,000. The object of the organization is to conduct mining and milling operations in the State of Oregon. The home office will be in Terre Haute, Ind. R. W.

Reid, C. E. Test, W. E. English, H. S. New and A. R. Hovey, incorporators.

#### MICHIGAN.

##### HOUGHTON COUNTY—COPPER.

**Calumet & Hecla.**—The work of remodeling the stamp mills at Lake Linden is progressing steadily, another stamp entering service again this week. Work on the superstructure of the new electric power plant at the mill location is under way, the Wisconsin Bridge & Iron Co., of Milwaukee, Wis., having the contract.

**Isle Royale.**—Sinking in No. 2 shaft is under way to the 18th level. The drift on the Portage lode, north of No. 1 shaft, is in good copper ground. Both the north and south drifts on the first level of the new shaft on section 2 are breasted in copper ground. Diamond drill operations to the south of the shaft have not revealed anything of importance lately.

**Quincy.**—Sinking in No. 8 shaft, on the Mesnard property, is approaching a depth of 3,000 ft. The work of opening this shaft will be pushed steadily, and it is expected to connect it with the older workings to the south by a drift north from No. 6 shaft within eight months. Rock shipments from No. 8 average 400 tons daily. A Huntington mill is being installed at the stamp mills, and a steeply-compound stamp has been contracted for.

**Rhode Island.**—Development work at this property is advancing satisfactorily, the present outlook being the best in the last year. Openings on the Allouez conglomerate near the line of Franklin Junior, adjoining on the south, offer the most encouragement.

**Winona.**—Production has been discontinued at this property, and all energy is being confined to development work in anticipation of making a large product later on. Work is confined to No. 2 and 3 shafts, the latter penetrating the best ground. Drifts south from No. 3 on the fourth and fifth levels are opening excellent cupriferous ground.

##### KEWEENAW COUNTY—COPPER.

**Ahmeek.**—Sinking in No. 1 shaft has reached the fifth level at a depth of 588 ft. Rock shipments to the Tamarack mill, where one head is used, average 180 tons a day.

**Mohawk.**—Work on a frame rock-house for No. 5 shaft is being pushed, and as soon as it is completed underground operations will be resumed. The structure is nearly finished. It will be equipped with one rock-breaker. Railroad connection has been established, 200 ft. of track-laying being necessary. No. 5 shaft is down 70 ft., and when sinking is resumed it will be opened to a depth of 175 ft., where a plat will be cut and the first level established. Drifting north and south at that point will also be commenced. Excellent values have been penetrated for practically every foot of sinking which has been done in No. 5 shaft. The good showing which was manifest at surface continued for the entire depth.

#### MISSOURI.

##### JASPER COUNTY.

**Prosperity.**—The fee of the Central Forty, near this place, has been sold to B. M. Robinson for a reported consideration of \$40,000. The contract includes 40 acres of land and was owned by H. J. Vancil.

**Continental.**—Four lots of this tract at Joplin have been leased by Messrs. Corbin, Williams, Holcomb and Epple, of New York and New Jersey. The property

is a part of the old Imperial mine. The reported consideration is \$12,000.

### MONTANA.

#### CARBON COUNTY.

*Gebo.*—This coal mine at Red Lodge has been closed by an injunction order issued by the attorney-general.

#### DEER LODGE COUNTY.

*Southern Cross Mining Co.*—Suit has been brought against this company and several individuals by Samuel Landry and Andrew Nelson to recover \$17,000 alleged to have been taken illegally from the property of the plaintiffs.

#### FERGUS COUNTY.

*Barnes-King.*—Negotiations which have been pending for the sale of this mine, to New York and London parties, are at an end. It is said that the owners of the property are in no hurry to dispose of it. It is paying dividends, and there is sufficient ore in sight to keep the mill running for years.

#### GRANITE COUNTY.

*Granite Mountain Bi-Metallic Co.*—This company has worked its properties steadily during the larger part of 1904, and has kept 50 stamps working the greater part of that time.

#### LEWIS AND CLARKE COUNTY.

*Whitlatch-Union.*—An important strike is reported at this mine, four miles south of Helena. It has been a rich producer, but was idle for many years. Last summer it was taken over by a local syndicate.

#### MISSOULA COUNTY.

*Shamrock Gold Mining & Milling Co.*—This company has been formed with a capital of \$1,250,000 to mine lands and acquire property in this county. The directors are as follows: Patrick Burke, Thompson Falls, Mont.; Geo. T. Eckert, Troy, Ill.; J. W. Garnet, Troy, Ill.; Benj. Jacobs, Thompson Falls, Mont.; Wm. Hagler, Thompson Falls, Mont.; H. Lee Servoss, St. Louis, Mo., and Christian Busse, Jr., Troy, Ill.

#### POWELL COUNTY.

*New York-Montana Mining Co.*—Active operations are being carried on at this company's property at Coloma. The company is composed chiefly of New York men. Water has been taken from the old workings of the mine to a depth of 210 ft., and preparations are being made to open the vein at this point.

*Nancy Hanks.*—Shipments are being made from this and the Tiger mine to the East Helena smelter. The ore in the claims is of brown oxide.

### NEVADA.

#### STOREY COUNTY—COMSTOCK LODGE.

The following facts in regard to work at the Comstock Lodge are taken from an interview with Franklin Leonard, Jr., in the *New York Commercial*:

Operations on the Comstock Lode are going steadily forward. The Comstock Pumping Association has already lowered the water more than 600 ft., beginning with the Evans hydraulic elevator, and later using the Reidler electrical pumps; and discharging the water into the Sutro tunnel, north branch, whence it flows out to the Carson river valley. The Ward Shaft Association has reclaimed and re-timbered the Ward shaft about 1,900 ft., and installed modern machinery and a

small plant, which is discharging its water into the south branch of the Sutro tunnel. The Gold Hills mines have undertaken drainage at the south end through the Alta shaft, which is now being rapidly timbered throughout and will soon be prepared to discharge its part of the work. These three groups of mines are now working in harmony, all basing their operations upon use of the Sutro tunnel and its branches, now owned by the Comstock Tunnel Co. The big pumps now in operation are installed at the shaft of the Consolidated California & Virginia mine, and their complete success has been demonstrated by the discovery and extraction of large bodies of ore in that mine since beginning operations. The discovery of the new Ophir bonanza is also a direct result. Important work is being pushed in the Gould & Curry and Justice mines. Shaft No. 2 on the Brunswick lode, will be sunk toward the tunnel level, and probably an upraise made from the tunnel to meet it, so that the drainage and ventilation for the Brunswick lode would seem assured.

### NEW MEXICO.

#### COLFAX COUNTY.

*Oro Dredging Co.*—This company's steam dredge on the Moreno river, near Elizabethtown, is being repaired and put in condition for the resumption of operations early next spring. R. J. Reiling is manager.

#### LUNA COUNTY.

*Hancock.*—This property, in the Tres Hermanas district, has been purchased by E. E. Burdick. It was formerly owned by the Hancock Mining Co., and is equipped with modern machinery.

*Tri-State Mining Co.*—This company has acquired the Big Helena and Hard Times mines in the Cooks Peak district. Development work will be begun at once.

#### SANTA FE COUNTY.

*Gold Bullion Mining Co.*—This company is installing new machinery on its property, near Golden, to take place of the old machinery which suffered damage from the floods last October. The new machinery will be on wheels, and can be moved out of the gulch when threatened by floods. When completed it will probably handle 2,200 cu. yd. of dirt a day.

### OHIO.

#### BELMONT COUNTY.

*Youghiogheny & Ohio Central Coal Co.*—This company is spending about \$50,000 to open a new mine on Glens Run, near Martin's Ferry, which will have a larger capacity than any mine in eastern Ohio save one. The Pennsylvania railroad is building a three-mile road to reach the property.

### OREGON.

#### BAKER COUNTY.

*Golconda Consolidated Gold Mines.*—A temporary restraining order has been issued to prevent the sale of this company's property. A movement was made by Eastern stockholders to reorganize this company, but litigation arose which prevented this.

*Queen of the West.*—It is reported that about \$50,000 will be spent to develop this property at Cornucopia. A milling plant for amalgamation and concentration has already been ordered for early delivery.

A 10-stamp mill is now in operation.

*White Swan.*—This mine will probably be re-opened next spring.

*Overland.*—A good orebody has been reported opened up in Tunnel No. 2, of this mine at Cable Cove. Drifting on the ore shoot for 60 ft. shows it to be from two to five feet in width, and to run about \$40 in gold. The orebody was encountered at a depth of about 200 feet.

*Highland.*—Rapid progress is being made in installing a new plant at this mine. It is expected that the plant will be ready for operation about the middle of January. It will handle from 40 to 70 tons of ore per day. The concentrate will be shipped to the smelter at Sumpter, as rapidly as car accommodations can be secured.

*Dixie.*—A 5-stamp mill is to be erected at this mine at Quartzburg.

*Black Butte.*—The new stamp mill at this mine has been given a trial run of 10 days, with satisfactory results.

#### DOUGLAS COUNTY.

*Le Roy Mining Co.*—The interests of J. Frank Le Roy and A. D. Le Roy, in this property at Bohemia, have been acquired by E. O. Tobey and others. It is understood that development operations will be undertaken at once at the mine.

#### JACKSON COUNTY.

*Blue River.*—A large refractory ore property is reported uncovered in this district, near Gold Hill, on three claims owned jointly by W. H. Morton and William Lockwood, of Portland. There is an abundance of water and timber in the vicinity, and a mill and cyanide plant will be installed in the spring.

#### MALHEUR COUNTY.

*Uncle Sam Mining & Milling Co.*—The property of this company at Malheur includes 10 1-3 quartz claims and about 300 acres of placer ground. The company has ditches, reservoirs, pipe and hydraulic giants all in readiness to begin placering as soon as spring opens. At present, a 300-ft. shaft is being sunk and a 20-stamp mill will be erected during the summer. The ore shoot on the Uncle Sam has been sunk on with an incline shaft to a depth of 85 ft. The vein is from five to six feet wide and gives an average assay at 85 ft. deep of \$74 per ton. There are four other shafts in about 85 ft. on this property.

*Daisy Mining Co.*—This company's claims join the Uncle Sam claims. A 30-ton mill is being built. There has been considerable development work done on this group; 90 ft. have been sunk on an 18-in. vein that averages \$100 per ton.

### PENNSYLVANIA.

#### ANTHRACITE COAL.

*Winton.*—This colliery northeast of Jessup, which was abandoned some years ago by its owners and was recently purchased by the Sunnyside Coal Co., of Scranton, will be re-opened; the breaker is in course of re-construction.

*Evans.*—This colliery at Beaver Meadow, operated on the lease from the E. S. Van Wickle estate, has been closed down; 500 men and boys have been thrown out of employment.

*Philadelphia & Reading Coal & Iron Co.*—Operations at the property of this and other companies throughout Schuylkill county have been retarded by floods. Many cave-ins at mines are reported.



## BITUMINOUS COAL.

**Connellsville Central Coal & Coke Co.**—Two tracts of land near New Salem are reported to have been sold to this company for \$55,000. One tract contains 33, and the other 36 acres.

**Keystone Coal & Coke Co.**—This company will resume operations at its property at Meyersdale, which was formerly operated by the Continental Coal & Coke Co., and went into bankruptcy last year. The company has closed a deal for the purchase of 704 acres of land in Bethel, Cambria county, for a reported price of \$75,000.

**United States Steel Corporation.**—This company is reported to have taken an option on 9,000 acres of coal land at East Bethlehem, West Bethlehem, and West Pike Run townships and Deems town and Beallsville boroughs. The reported option price is \$333 an acre.

**Century Coal & Coke Co.**—Operations at this company's property near Brownsville have been begun. The plant will be enlarged to 150 ovens.

**Pittsburg Gas Coke Co.**—Suit has been brought against this company by the Goff-Kirby Coal Co., of Cleveland, Ohio, to recover \$53,190 with interest from April 30, 1903. The suit is the result of the great coal strike in the anthracite region.

## WASHINGTON.

## FERRY COUNTY.

**Jupiter.**—This company has been incorporated with the following officers: E. R. Fraser, president; Charles Garber, vice-president; J. C. Kerley, secretary, and J. L. Harper, treasurer and general manager. The nominal capital is 2,000,000 shares at \$1 each, par, non-assessable. The company owns the Manila mine, at Keller, on the south half of the Colville Indian reservation.

**Morning Glory.**—This mine has been leased for two years. The lessee has a streak of ore on the tunnel level three inches wide, which carries fine particles of native gold.

**El Caliph.**—This mine is under lease. The lessees have shipped a carload of assorted ore from the dump and another from an underhand stope below the upper tunnel level.

**Minnehaha Gold-Copper Mining Co.**—This company, in the Curlew mining district, has operated the Minnehaha mine continuously and shipped about 20 carloads of ore during 1904. The shaft has been sunk to the 250-ft. level, and several hundred feet tunnel, drifts and cross-cuts have been driven.

**Lucille Dreyfus.**—This mine has been under lease during the fall and winter and has put out and shipped about 12 tons of ore a day.

**Faithful-Surprise Mining Co.**—This company drove 100 ft. on a new tunnel last fall and suspended work for the year.

**Shonoe Mining & Milling Co.**—This company, in 1903-4, drove a cross-cut tunnel 600 ft. and intersected the vein 30 in. wide at a depth of 200 ft., the ore running about \$60 a ton in gold and copper. A substantial wagon road was built to the mine, and an air-compressor plant is now being installed.

**Brimstone Mining & Milling Co.**—This company did considerable exploratory work during the year and has mined some good ore.

**Park City.**—This is the center of a radius of six miles of mineral land in the northern part of the north half of the

Colville Indian reservation, extending from the Sans Poil river westward to the Okanogan county line. Mineral veins, the payable ores of which are principally basic, traverse the mountains in every direction, but usually trending northeasterly. During the last six or eight months of 1904 the talk of a railway down the Sans Poil valley and the installation of a smelter at West Fork drew unusual attention, and the construction of a wagon road up the west fork of the Sans Poil river to Park City has since resulted in greater mining activity than ever before in that vicinity. The mineral veins lie in limestone or contacts of limestone beds and igneous dikes. The chief mines are mentioned below.

**Midnight Mining Co.**—This company owns the Mountain Boy group of claims, in which are the Mountain Boy, Silver King, Copper King, Little Girl and Mountain Boy Traction. The company began to prepare for a camp about October 1, 1904, and has since constructed a boarding and bunk house, stable, and, recently, a building for the superintendent's quarters and assay office. An ore vein from three to eight feet in width is under development. It traverses the ridge of a mountain spur northeasterly and southwesterly, and dips to the northwest. It had produced \$2,700 net previous to occupation by the present owners. Under the original ownership and a lease a tunnel was driven 60 ft., and a winze was started and sunk four feet on the vein. Two drifts were also driven on the vein, one running 40 ft. northeasterly and the other 30 ft. southwesterly. The Midnight company drove a tunnel 60 ft., crossing the vein on low-grade ore at 30 ft. The vein there is broken over on the foot-wall and has a low angle of declination. After crossing the ore the tunnel penetrated the lime rock of the hanging-wall 50 ft. The formation above and below the vein is more or less altered limestone, with feldspar, intermixed here and there with calcite. It carries oxide and sulphide of iron and some arsenide, besides the regular constituents. In the old workings this company followed the pay shoot down the winze, which now has a depth of over 168 ft., and shows the vein straightening up from 12° to an angle of about 40°. The shipping ore is sacked from a streak 8 to 20 inches wide, to run about \$200 a ton. About three or four inches of that width the ore is very rich, and samples from it have assayed over \$5,000 a ton. All of the ore outside the pay streak is dumped by itself after mining, and will await the installation of a smelter at West Fork. The shipping ore weighs about 200 and the low-grade from 120 to 125 lb. to the 100 lb. sack. A tunnel, lower down the hill, is in 260 ft., and has passed under the apex of the vein, and stringers of quartz are coming in at the face. It is believed this tunnel will strike the vein about 180 ft. on the dip. The mountains in the neighborhood are rugged and steep, and mineral veins are numerous and traverse them in all directions.

**Park-Central Mining Co.**—This company owns a group of five claims—the Park, Central, Tip Top, Monument and Apex. They are situated under Davis peak, the highest elevation in the Nespelem range, at about one and one-half miles east of the Mountain Boz mine. Three shafts were sunk on the Park claim, two of them in country rock; the third is in ore 35 ft., but at that depth bottoms on a broken formation. It was abandoned, and a tunnel was driven about 700 ft. At 625 ft. from the portal, a crosscut was driven eastward 62 ft., which intersected

the vein 17 ft., going to the hanging wall. A winze was started at 12 ft. back from that wall and sunk 56 ft., following a mixture of galena ore and veinstone at a low angle of declination, on a break in the vein and dropping onto the hanging wall, which appears there to be in place and not disturbed. A drift was driven 40 ft. northeasterly on the hanging wall. Between 400 and 500 tons of ore on the tunnel dump is reported to run from \$60 to \$65 a ton in silver and lead, with a little copper and small value in gold.

**Combination.**—This property adjoins the Park-Central group on the north. An incline is down 60 ft. on the vein. Galena, three feet wide, is exposed at the top.

**Hobson.**—This mine lies next the Park-Central on the south. On a vein four and one-half feet wide a shaft has been sunk and a short drift driven. The ore is silver-lead and runs from \$46 to \$90 a ton.

**Summit.**—This property, at the northwest end of the Combination, has a big vein, with open cuts across the copping and a shaft down 25 ft., in all of which ore is exposed that runs \$40 and upwards per ton in gold, silver and lead.

**Florence and Leader.**—These claims are on the northeastern boundary of the Combination. Two shafts, each 50 ft. deep, were sunk on a five-foot vein. The ore runs \$30 a ton in gold and silver.

## WEST VIRGINIA.

## DICKINSON COUNTY.

H. B. Hollins & Co., of New York, and Eugene Zimmerman, of Cincinnati, have purchased 12,000 acres of coal lands in this and Wise counties from the Clinchfield Corporation. The purchase of these lands includes also the purchase of two railroads, the Virginia & Southwestern and the Virginia & Southeastern. The total price paid is said to be \$3,300,000. The purchasers assume the bonded indebtedness of \$600,000 and the general indebtedness of \$1,100,000, and they pay \$1,600,000 in cash.

## Foreign Mining News

## AFRICA.

## NATAL.

The Mines Department reports that the production of coal in the colony, in September, was 66,618 tons, an increase of 1,925 tons over September, 1903. Exports of coal for the month were 1,692 tons, and there were 30,843 tons sold to steamers in the port of Durban.

## CANADA.

## BRITISH COLUMBIA—BOUNDARY DISTRICT.

**Boundary Ore Shipments.**—Shipments for the week ending Jan. 7 were as follows, in tons: Granby, 6,450; B. C. Copper Co., 2,496; Dominion Copper Co., 60; Brooklyn, 1,650; Rawhide, 1,200; Sunset, 240; Mountain Rose, 120; Emma, 132; Oro Denoro, 33; Senator, 99; total for the week, 12,493 tons.

## MEXICO.

## CHIHUAHUA.

H. L. Dignowity, of San Antonio, and associates, have taken over 45 *perenen-cias* at Naica, in close proximity to the properties that are now in bonanza. The amount paid is not given out. Active work will be commenced in the very near future. Naica is 16 miles north of Concho, on the Mexican Central railroad.

CHEMICALS, MINERALS, RARE EARTHS, ETC.—CURRENT WHOLESALE PRICES.

(See also Market Reviews.)

<b>ABRASIVES—</b>		<b>COPPERAS—</b> Bulk.....100 lb. .47½	<b>POTASSIUM—</b>
Bort as to size.....carat,\$10.00@18.00		In bbls......52½	Bicarbonate cryst..... lb. .08½
Carborundum, f.o.b. Niagara Falls, Powd..... lb. .10			Powdered or gran..... .14
Grains......10			Bichromate, Am..... .08½@.08½
Corundum, N. C......07@.10			Scotch......08½@.08½
Chester, Mass......04½@.05			Bromide......30
Craigmont, Ont......05½@.06½			Carbonate (80@85%)..... 3.50@4.00
Mont. f.o.b. Chicago......07@.07½			Caustic, ordinary......04½
Crushed Steel, f.o.b. Pittsburgh......05½			Elect. (90%)......06½
Emery, in kegs: Turkish flour......03½			Chlorate, powdered......08½@.08½
Grains......05@.05½			Crystals......19@.20
Naxos flour......03½			Cyanide (98@99%)..... 9.30
Grains......05@.05½			Kainit.....lg. ton 9.30
Chester flour......03½			Manure salt 20%.....100 lbs. .66
Grains......05@.05½			Double Manure Salt, 48@53%..... 1.12
Peekskill, f.o.b. Easton, Pa., flour......01½			Muriate, 80@85%..... 1.83
Grains, in kegs......02½			95%..... 1.86
Garnet, per quality, sh. ton 25.00@35.00			Permanganate..... lb. .09½@.09½
Pumice Stone, Am. Powd., lb. .01½@.02			Prussiate, yellow......13½@.13½
Italian, powdered......01½@.01½			Red......34½@.35
Lump, per quality......04			Sulphate, 90%.....100 lb. 2.11
Rottenstone, ground......02½@.04½			96%..... 2.14
Lump, per quality......06@.20			Sylvinit..... unit .41
Rouge, per quality......10@.30			<b>SALT—</b> N. Y. com. fine 280 lb. .bbl. .72@1.18
Steel Emery, f.o.b. Pittsburgh......07			N. Y. agricultural..... sh. ton 4.40
<b>ACIDS—</b>			<b>SALTPETER—</b> Crude.....100 lb. 3.90@4.00
Boracic, crystals......10			Refined..... 4.25@4.75
Powdered......10½			<b>SILICA—</b>
Carbonic, liquid gas......03			Ground quartz, ord'ry..... sh. ton 9.00@10.00
Hydrofluoric, 30%......05			Best..... 12.00@13.00
48%......11			Lump Quartz..... 2.50@4.00
60%......11			Glass sand..... 2.75
<b>ALCOHOL—</b> Grain..... gal. 2.38@2.40			<b>SILVER—</b> Nitrate Crystals..... oz. .38½
Refined wood, 95@97%......60@.65			<b>SODIUM—</b>
Purified..... 1.25@1.30			Bicarb., ord., bulk, f.o.b. works..... 100 lb. 1.30
<b>ALUM—</b> Lump.....100 lb. 1.75			Extra domes, f.o.b. works..... 3.50
Ground..... 1.85			Bichromate..... lb. .06½
<b>ALUMINUM—</b> Sulphate, com'l. .75@1.25			Carbonated ash, high test, in bags, f.o.b., works..... 100 lb. .75@.77½
<b>AMMONIUM—</b>			Foreign, f.o.b. N. Y..... .85@.87½
Carbonate lump......07½			Caustic, 60@78%, f.o.b., works..... 1.75@1.85
Powdered......08½			Foreign, f.o.b. N. Y..... 1.90@1.95
Muriate grain......05½@.05½			Chlorate com'l......08½@.08½
Lump......09½			Hyposulphite, Am..... 1.50@1.60
<b>ARSENIC—</b> White......03@.03½			German..... 1.75@2.00
Red......06½@.06½			Phosphate..... lb. .02½@.02½
<b>ASPHALTUM—</b>			Sal soda, f.o.b. works..... 100 lb. .60
Barbadoes......bbl. .30			Foreign, f.o.b. N. Y......67½
Cuban......lb. .01½@.03½			Silicate, concentrated..... lb. .05
Egyptian, crude......06@.07			Com'l......01
Gilsonite, Utah ordinary......03@.03½			Sulphate, com'l.....100 lb. .65
Trinidad..... 35.00			<b>SULPHUR—</b> Roll.....100 lb. 1.85
<b>BARIUM—</b>			Flour..... 1.90
Carb. Lump, 80@90%..... sh. ton 25.00@27.00			Flowers, sublimed..... 2.20
92@98%..... 26.00@29.00			<b>TALC—</b> N. C., 1st grade..... sh. ton 20.00
Powdered, 80@90%..... lb. .01½@.02			N. Y. Fibrous best..... 10.25
Chloride, com'l.....100 lb. 1.25			French, best..... 20.00
Chem. pure cryst..... lb. .05			Italian, best..... 30.00
Nitrite, powdered......05			<b>TAR—</b> Oil bbl. (50 gal.)......bbl. 5.15
Sulphate (Blanc Fixe)......02			<b>TIN—</b> Crystals, bbl..... lb. .22
<b>BARYTES—</b>			<b>URANIUM—</b> Oxide..... 2.25@3.00
Am. Crude No. 1..... sh. ton 9.75			<b>ZINC—</b> Metallic ch. pure......07@.09½
Crude No. 2..... 8.00			Chloride solution, com'l......02½
Crude No. 3..... 7.00			Chloride granular......04½@.04½
Floated..... 16.75@18.00			Dust......05@.05½
Foreign floated..... 18.75@20.50			Sulphate......02@.02½
Snow-white..... 17.25@18.75			
<b>BAUXITE—</b> Ga. or Ala. Mines:			
First grade.....lg. ton 5.25@5.50			
Second grade..... 4.50@4.75			
<b>BONE ASH......02½@.02½</b>			
<b>BORAX......07½@.07½</b>			
<b>BROMINE—</b> Bulk......45			
<b>CADMIUM—</b> Metallic..... 1.40			
<b>CALCIUM—</b> Acetate, gray..... 2.00			
Acetate, brown..... 1.35			
Carbide, ton lots f.o.b. Niagara Falls, N. Y., for Jersey City, N. J..... sh. ton 65.00			
Chloride, f.o.b. wks..... 9.00@10.00			
<b>CEMENT—</b>			
Portland, Am., 400 lb..... bbl. .90@1.25			
Foreign..... 1.25@1.75			
"Rosendale," 300 lb......80			
Slag cement......75@1.25			
<b>CHLORINE—</b> Liquid......30			
Water......10			
<b>CHROME ORE—</b>			
(50%) ex-ship N. Y.....lg. ton 9.00@19.50			
Bricks, f.o.b. Pittsburgh, M..... 175.00			
<b>CLAY, CHINA—</b> Am. com. ex-dock, N. Y.....lg. ton 7.75@8.00			
Am. best ex-dock, N. Y..... 9.00@9.25			
English, common..... 11.00@11.25			
Best grade..... 16.75			
<b>CRYOLITE......06½</b>			
<b>EXPLOSIVES—</b>			
Blasting powder, A......25-lb. keg .65			
Blasting powder, B..... 1.40			
"Rackarock," A..... lb. .25			
"Rackarock," B......18			
Judson R. K. powder......10			
Dynamite (20% nitro-glycerine)......13			
(30% nitro-glycerine)......14			
(40% nitro-glycerine)......15			
(50% nitro-glycerine)......16½			
(60% nitro-glycerine)......18			
(75% nitro-glycerine)......21			
Glycerine for nitro......11½@.11½			
<b>FELDSPAR—</b> Ground..... sh. ton 9.75@10.00			
<b>FLINT PEBBLES—</b>			
Danish, Best.....lg. ton 14.75			
French, Best..... 11.75			
<b>FLUORSPAR—</b>			
Lump..... sh. ton 8.00@10.00			
Ground..... 11.50@13.50			
<b>FULLER'S EARTH—</b> Lump.....100 lb. .80			
Powdered......85			
<b>GRAPHITE—</b>			
Am. pulverized..... 45.00			
Best flake..... 150.00			
Ceylon, common pulv..... lb. .02½@.03½			
Best, pulverized......04@.08			
German, com. pulv......01½@.01½			
Best, pulverized......01½@.02			
Italian, pulverized......01½			
<b>GYPSUM—</b> Ground..... sh. ton 8.00@8.50			
Fertilizer..... 7.00			
Rock.....lg. ton 4.00			
English and French..... 14.00@16.00			
<b>INFUSORIAL EARTH—</b>			
Ground Am. best..... 20.00			
French..... 37.50			
German..... 40.00			
<b>LEAD—</b> Acetate, white..... lb. .09@.09½			
Brown......07@.07½			
Nitrate, com'l......06½			
granular......08½			
<b>MAGNESITE—</b> Greece.			
Crude (95%).....lg. ton 6.50@7.00			
Calcined..... sh. ton 16.50@17.00			
Bricks, best imp. f.o.b. N. Y..... M. 155.00			
Bricks, domes, per qual., f. o. b. Pittsburgh..... 160@200			
<b>MAGNESIUM—</b>			
Chloride, com'l..... lb. .01½			
Sulphate.....100 lbs. .55@.95			
<b>MANGANESE—</b>			
Crude powd.....			
70@75% binioxide..... lb. .01½@.01½			
75@85% binioxide......01½@.02½			
85@90% binioxide......02½@.03½			
90@95% binioxide......03½@.05½			
Ore..... unit .18@.20			
<b>MARBLE—</b> Flour..... sh. ton 6.00@7.00			
<b>MICA—</b> N. Y. gr'nd, coarse..... sh. ton 33.00@38.00			
Fine..... lb. .00½@.02			
Sheets are sold as to size and quality.			
<b>MINERAL WOOL—</b>			
Slag, ordinary..... sh. ton 19.00			
Selected..... 25.00			
Rock, ordinary..... 32.00			
Selected..... 40.00			
<b>OZOKERITE......11½</b>			
<b>PAINTS AND COLORS—</b>			
Litharge, Am. pow'd......05½@.06			
English glassmakers......08½@.08½			
Lithophone......02½@.06			
Metallic, brown..... sh. ton 19.00			
Red..... 16.00			
Ocher, Am. common..... 8.50@9.00			
Best..... 16.00			
Dutch, washed..... lb. .02½			
French, washed......01½@.01½			
Paris green, pure, bulk......12			
Red lead, American..... lb. .06½@.06½			
Foreign......07@.08½			
Turpentine, spirits..... gal. .56			
White lead, Am., dry..... lb. .05@.05½			
American, in oil......06@.06½			
Foreign, in oil......09@.09½			
Zinc white Am. extra dry......04½@.04½			
Foreign, red seal, dry......06@.08½			
Green seal, dry......06½@.09½			

The Rare Earths.

<b>BORON—</b> Nitrate..... lb. \$1.50
<b>CALCIUM—</b> Tungstate(Scheelite) " .60
<b>CERIUM—</b> Nitrate..... 10.00
<b>DIDYMIUM—</b> Nitrate..... 35.00
<b>ERBIUM—</b> Nitrate..... 40.00
<b>GLUCINIUM—</b> Nitrate..... 20.00
<b>LANTHANUM—</b> Nitrate..... 30.00
<b>LITHIUM—</b> Carbonate..... 1.50
<b>LITHIUM—</b> Nitrate..... .60
<b>STRONTIUM—</b> Nitrate..... lb. .07@.07½
<b>THORIUM—</b> Nit. 49@50%..... 4.50
<b>URANIUM—</b> Nitrate..... oz. .25
<b>ZIRCONIUM—</b> Nitrate..... lb. 8.00

Note—These quotations are for wholesale lots in New York, unless otherwise specified, and are generally subject to the usual trade discounts. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable.