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The speculation in California oil stocks is attaining considerable proportions, and in San Francisco the Oil Exchange is crowded with business, while the Mining Stock Exchange is even more neglected by the public than it has been for several years past. At first the dealing in oil stocks in San Francisco was limited chiefly to those of producing companies, but now there are prospects of all kinds on the list, and the public seems to call for them as freely as for the other class. The boom promises to be quite an extensive one.

The extension of gold-dredging work has been an especial feature of the past year in California. Dredging has been carried on for some years in a limited way; but the report recently presented to the Miners' Association, at the annual meeting in San Francisco, showed that operations of this class are now actively carried on in Siskiyou, Trinity, Yuba, Butte, Nevada, Shasta and Placer counties. There are 20 dredges at work in all, and their product will form an appreciable addition to the gold production of the State. The total is estimated at not less than \$1,000,000 for the year.

The comparative scarcity and high price of quicksilver have stimulated prospecting for the ores of that metal. This has been the case especially in Australia, where cinnabar has been found in different places, though it has never been worked to any extent. In New South Wales, however, systematic development has been undertaken upon a deposit near Yulgilbar, in the Clarence River District, which was lately examined by the Government geologists, who reported the existence of lodes which appear promising. Nearly 1,000 tons of ore have been taken out, and a working test is to be made. In New Zealand, also, work is to be undertaken on the Ohacawai deposit, on which a favorable report was lately made by experts.

Affairs in the Transvaal do not seem to improve, if, as the despatches announce to-day, Gen. De Wet and his force have again escaped from the British detachments sent against them. Good authorities estimated that there are still about 15,000 Boers in arms, and in a country like the Transvaal that number can give a great deal of trouble. Meantime the military conditions still prevent a general return of workmen to the Witwatersrand, and the date for reopening the mines is still postponed. The disappointment to British stockholders is great, especially as there is no prospect of an improvement soon. The mining companies have given many orders for machinery and supplies, but these cannot be forwarded until there is a material change.

A few months ago we mentioned that the Societe Anonyme Miniere, of Liege, Belgium, which has acquired the Frongoch zinc mines in Cardiganshire, Wales, had imported Italian laborers to work the property. This action has been much resented by the Welshmen, and riots have been so frequent that the constant presence and attention of the police have been necessary. It is doubtful whether the Italian colony will be happy in Wales, and very few among them will make a permanent home there, if indeed any of them do so. The fact is that in Great Britain they are not yet so well accustomed as we are to mining communities made up of many nations, and are apt to resent the introduction of any foreigners. Welshmen are especially clannish and opposed to outsiders; though they are found of emigrating themselves, and have done very well in America.

Our London correspondent has mentioned several times during the last year or so that the International Zinc Company of Boston has been endeavoring to sell its shares in England, through the agency of a company called the Foreign Syndicate, Limited, of London. Seeing that this company has been shown up so often, it is surprising to find that it is still offering its wares. This time it is the British Investors' Underwriting Corporation, Limited, an equally irresponsible creation, that is offering the shares of the International Zinc Company, and its excuse is that their client, a prominent American shareholder, has met with stock exchange losses and is obliged to realize in order to be able to meet his creditors. We can only say that if anyone desires experience in losses in mining stock transactions he might find it advantageous to buy some of the International Zinc Company's shares are now offered.

The German iron trade, like the British, is in a doubtful condition. Demand is lighter than for a long time, the mills complain that no new orders are coming in, and there has been a fall in prices ranging from 10 to 25 per cent. The quotations, however, are still much above those of a year ago. Many of the manufacturers have practically given up the home trade for the present, and are looking to export business entirely to keep them going. The prospects are, however, that British competition is going to be very sharp, as the conditions there are very similar to those in Germany. In the latter coun-

try the great point of interest just now is the extent to which the United States is going in for foreign trade. On this largely depends not only the amount of business to be secured, but also the prices to be obtained. The general belief abroad is that American mills can undersell those of Europe, if they are disposed to do so, and any signs of their intentions are watched very closely.

The Committee on Coinage, Weights and Measures, of the House of Representatives, has unanimously agreed to report at once the Shaproth bill, with a strong recommendation for its passage. The bill is short and plain, simply providing "that on and after January 1st, 1903, all the departments of the Government of the United States in the transaction of all business requiring the use of weight and measurement, except in completing the survey of public lands, shall employ and use only the weights and measures of the metric system, and on and after January 1st, 1903, the weights and measures of the metric system shall be the legal standard weights and measures of and in the United States."

This action is encouraging, but the time of Congress at the short session is very fully occupied, and the friends of the metric system should see that the bill is not neglected. They can help by calling the attention of congressmen individually to the importance of the passage of the bill, and by bringing the subject forward in every possible way. The beginning has been made, and it remains only to see that the bill is not dropped for want of time and attention.

CONSOLIDATION IN THE ANTHRACITE TRADE.

From time to time, for years past, the "Engineering and Mining Journal" has pointed out that a drift toward consolidation among the Pennsylvania anthracite mining concerns has existed since the early days of the industry. The growth of the anthracite industry with its peculiar features has been described so many times that our readers should be familiar with the general facts, and our reason for alluding to it again is the recent purchases of mines or anthracite mining stocks by the larger mining and transportation companies, these purchases having elicited some singularly ignorant and foolish criticism from a prominent New York newspaper.

Owing to the value of anthracite as a fuel, and the nearness of the fields to tide-water, there have been almost always more mines opened, and more railroads connecting the mines with tide-water points than the consumptive demand warranted at any given time. In short, there has been an over-production of both coal and railroads, with resulting poor profits all around. The fact that the anthracite fields are limited, and a mistaken idea of the comparative value of anthracite and bituminous coal lead to the larger roads seeking to control the fields by buying or leasing at high royalties all available coal lands along their lines. To keep solvent the roads most heavily burdened with coal lands have been forced to keep up freight rates from the mines to tide-water points. The smaller mining companies being dependent on the railroads, have too often had cause to feel that they had no appeal from these freight rates or the number of cars per month allotted them, and consequently there has long been an agitation for new roads that should impose less onerous terms. This agitation has been helped by uninformed newspapers in New York or other cities claiming that a new road would carry coal cheaper than the old ones, and hence coal would be cheaper to consumers.

In some editorials on the great strike of the miners last fall we pointed out that unless the companies that virtually control the output of coal at present radically changed their methods of getting the energy in the coal to the consumer, the only hope for a fair return on the capital now invested lay in still further consolidations among mining and transportation companies, the ultimate goal being a combination that would increase mining at collieries where coal could be produced cheapest and close down all unprofitable workings.

The leaders of finance now holding anthracite securities have been working toward the removal of disturbing elements for some time. Nearly two years ago Vanderbilt interests brought out the Temple Iron Company, which took over the properties held by a large independent concern between Wilkes-Barre and Scranton. This deal helped knock out a projected new line to tide-water, the New York, Wyoming & Western. In the previous year the Erie Railroad had taken over the New York, Susquehanna & Western, and when the Delaware & Hudson abandoned its canal from Honesdale to Rondout, it made a contract with the Erie to haul the coal for northern markets. Since the formation of the Temple Iron Company the New York, Ontario & Western Railway has bought up other coal lands about Scranton, some purchases having been announced within a few weeks.

The chief independent concern in the Wyoming region is the Pennsylvania Coal Company, controlling coal mines between Pittston and Carbondale and a short line of railroad. After the the Delaware & Hudson abandoned the canal to Rondout, men connected with the

Pennsylvania Company tried to secure the right to build a new road, the Delaware Valley & Kingston, on the canal bed. This road would have excellent grades, and the project has been vigorously fought by the Erie, which handled the Pennsylvania Company's coal, and by other roads. Now comes the rumor that the Erie has secured a controlling interest in the Pennsylvania Coal Company. As this company last year shipped 2,347,061 tons of coal, or more than the Erie, the rumor is important if true, and all indications are that it is true. The Pennsylvania Coal Company has been a large dividend payer and has been well managed. With its purchase the projected Delaware Valley & Kingston road collapses, and the remaining independent coal companies in the Wyoming Valley must make what terms they can with the powers in control. The projected road, we are firmly convinced, would not have been of any permanent benefit to the anthracite industry, nor would it have resulted in more than a temporary cheapening of coal to the consumer. Like other such projects, it would have had to go through an inevitable receivership, if not previously taken over by some large road that did not want it, but acted in self defence. At present the anthracite trade is apparently on firmer foundations than for a long time.

The latest statement confirms the rumor of the sale. The price at which Pennsylvania Coal Company stock is transferred is not stated, but it has sold in New York at \$735 per share of \$100 par value.

THE INDEPENDENCE MINE AND ENGINEERS' REPORTS.

The error of an engineer in valuing an important mine is a matter of serious consequence to the entire industry and to the profession, for it tends to impair the confidence of capital in mining as a field for safe and profitable investment, and it discredits the just claims of engineers that with proper precautions it is possible to determine with substantial accuracy the actual value of any developed ore body.

These remarks are prompted by the recently published statements concerning Stratton's Independence Mine, of Cripple Creek, Colo., which statements assert that the value of the ore reserves is much less than the amount reported by the officers of the mine in their usual monthly reports.

The facts in the case, as far as ascertainable from the published reports of the company, from that of Mr. John Hays Hammond and from other reliable sources have been as follows: In March, 1899, Mr. T. A. Rickard made an extremely able and satisfactory report upon the Independence Mine after an exhaustive examination, and perhaps the most thorough sampling that has ever come to our notice, which showed that the ore reserves in the mine had a gross value of \$6,712,000, and a net value estimated at about \$4,360,000. On this report the mine was purchased in London at the extravagant and unjustified price of \$10,000,000. During the 17 months ending September 30th, 1900, it produced and sold ore of the gross value of about \$4,500,000, and made a net profit of about \$3,000,000. The reserves then in sight in the mine have been estimated by Mr. Hammond at \$2,300,000, a figure which is probably quite "conservative." These facts fully confirm the accuracy of Mr. Rickard's original report, and emphasize the fact that it is possible by careful sampling to determine with very great accuracy the actual value of the ore in a mine, even under the difficult conditions of a Cripple Creek ore body. Mr. Hammond further states that the bottom of the mine is now poor and he gives a gloomy outlook for the future of the property.

After the purchase of the mine by the English company Mr. Rickard was appointed consulting engineer, and the directors of the company appointed the former mine manager and foremen to their respective places, though some of them, it was understood at the time, were objected to by the consulting engineer. In September, 1900, Mr. John Hays Hammond was appointed advisory engineer, and Mr. Rickard, who was then in London, was made general manager. Before going to London Mr. Rickard had appointed Mr. Shipman mine manager, and instructed him to make a thorough re-measurement and re-sampling of the mine, work which he had commenced in September. Through this Mr. Shipman found that the reports made by his predecessor to Mr. Rickard, and embodied by Mr. Rickard in his reports to the company, as to the value of ore in the reserves were overstated. Mr. Shipman, in the absence of Mr. Rickard, promptly informed Mr. Rickard's representative, who, in turn, told Mr. Hammond, who was expecting to examine the mine in the interests of clients, of this depressing discovery.

Mr. Hammond and Mr. Rickard's representative decided to continue the sampling and to acquaint Mr. Rickard with the facts on his return to Denver. Mr. Rickard, on learning these facts, October 19th, cabled at once to the directors in London, who received his message October 20th, and this, they state, was the first intimation the board had of the over-estimation of the reserves in the property. The end of October Mr. Rickard and Mr. F. W. Baker again cabled the results of the further sampling of the mine to the company, which then issued a statement to its shareholders, and on December 7th a meeting of the com-

pany was held which, according to the cabled reports, was very stormy. Mr. Rickard was present and made a statement which we have not yet seen, but as we are familiar with the facts, and as these have been distorted in the newspaper reports that have come to our notice, we make this statement.

There can be no question but that this incident will have a very injurious influence upon Cripple Creek mines in particular, and upon mining in general, and it cannot fail also to affect injuriously Mr. Rickard and the profession of which he both was and is one of the most honored members.

Whether Mr. Rickard was too credulous in accepting, as he evidently did fully and in good faith, the reports of officials identified more or less with the vendor interests, may be open to question, but it should be remembered that the sampling of the ore reported from month to month by these men had been confirmed by the actual value of the ore produced during each of the sixteen or seventeen months of the company's operations, and this was certainly reasonable ground for faith in the truth of their statements of the value of the ore still in the mine.

There is no doubt Mr. Rickard was deceived. There is also no doubt whatever that the discovery of the deception was due to him and not to anyone else, and that throughout he acted as a man of honor and of absolute integrity.

The importance of these facts lie in the statement by Mr. Hammond, and which, doubtless, he based on the work of that very able engineer, Mr. F. Bradley, who, we believe, sampled the mine for him, that even at the very moderate depth of the Independence Mine (about 1,000 feet) the ore bodies become poor; a very serious matter if it can be considered typical of the veins of the district. We do not, however, believe that the developments made in the Cripple Creek mines justify such a conclusion, even if the facts should hereafter be shown to justify it in regard to the Independence.

The facts as above stated confirm and do not discredit the just claims that a skillful mining engineer can determine with substantial accuracy the actual value of the reserves of ore in a mine. There is absolutely nothing in connection with the whole unfortunate affair to throw any discredit on the skill as an engineer or the absolute integrity and honor of Mr. T. A. Rickard, a fact which it affords us great pleasure to place on record, and the readers of the "Engineering and Mining Journal" know well that if the facts had justified another conclusion it would have been stated in the interest of the public without fear or favor.

The Independence Mine may yet justify the good opinion its enormous output created, and we sincerely hope it will do so. It may be remembered with profit by engineers generally that all estimates of ore values should be "safe," and in this case that the lower the estimates the more room there would be for credit to the administration which should realize more than the reported amount.

NEW PUBLICATIONS.

"Montana Society of Engineers. Proceedings, 1899." Butte, Montana; published by the Society. Pages, 68; illustrated.

The Montana Society of Engineers has done some very good work and set a good example to societies with a much larger membership. The fact that so much has been accomplished by a comparatively small number, as a rule very actively engaged and widely scattered, shows a strong interest in the Society. This volume contains, besides the proceedings of the meetings, three leading papers. The first is President Eugene Carroll's annual address, which is an interesting summary of engineering progress in the State during the year. The second paper is on the "Reconstruction of the Big Hole Dam," by J. H. Harper; and the third is on the "Development of Roads and Street Pavements," by F. W. Blackford. The discussions are also given.

"Report of the Mine Inspector for the Indian Territory for the Year Ending June 30th, 1900." Luke W. Bryan, Inspector. Washington; Government Printing Office. Pages, 70; illustrated.

The output of coal in the Indian Territory has attained considerable importance. During the year ending June 30th, 1900, there were 32 companies or individual operators in the Territory, and the output was 1,900,127 tons of coal; an increase of 495,585 tons, or 35.3 per cent. over the previous year. There were 47,800 tons of coke made, and an increase in this product is expected, as much of the coal mined is good coking coal. The number of accidents was large, 40 men having been killed and 49 injured during the year; an increase over the previous year having resulted from the employment of many inexperienced miners. The report gives many particulars as to the different mines in the Territory and their operation.

"Annual Report of the Inspector of Mines of the State of Kentucky for the Year 1899." G. W. Stone, Inspector; C. W. Logan, Assistant. Louisville, Ky.; State Printers. Pages, 236.

This volume contains some interesting information in relation to the growing coal industry of the State of Kentucky. The State Inspector and his assistant are fully employed, and have accomplished a great deal of work, as shown in the report. They have, besides inspecting mines, to do much work that is usually performed by a State geologist; and Mr. Stone recommends strongly a renewal and completion of the work begun years ago by the former Geological Survey. So rich a State

as Kentucky surely ought to carry out this recommendation and thus complete a work of value to the State and its people. Some amendments to the mining law are also urged, notably the regulation of the quality of oil used in the mines. The report is general, practical and interesting.

"A Deep Waterway from the Great Lakes to the Gulf of Mexico." Chicago; the Illinois River Valley Association. Pages, 76; with maps and diagrams.

This pamphlet is a reprint of three notable papers on related subjects which were originally read before the Western Society of Engineers in Chicago, with a brief introduction. All of them treat of the plans for the establishment of a waterway or channel 20 ft. in depth from Lake Michigan at Chicago to the mouth of the Mississippi, and show their feasibility and how they can be carried out. Mr. James A. Seddon takes the section from the Gulf of Mexico to Cairo, writing on "Reservoirs and the Control of the Lower Mississippi." Mr. Lyman E. Cooley writes of the section from Cairo to Lockport, treating the various questions relating to the Upper Mississippi and the Illinois River. Mr. Isham Randolph covers the section from Lockport to Lake Michigan in his paper on the "Sanitary and Ship Canal of Chicago." All the papers are by able engineers and are well worth reading.

"Manual of Explosives. A Brief Guide for the Use of Miners and Quarrymen." By Courtenay De Kalb. Toronto, Ont.; the Ontario Bureau of Mines. Pages, 128; illustrated.

This little manual has been prepared for the Ontario Bureau of Mines in view of the great increase in mining in the Province and the number of casualties due to the careless or ignorant use of explosives by inexperienced men. It is what the name indicates, a plain, practical guide, which Prof. De Kalb's training and practical experience have enabled him to make as complete as the necessary limitations of space would permit. Chapter 1 describes the common explosives and Chapter 2 fuse, caps and methods of firing. Chapter 3 treats briefly of the theory of explosives and fumes. Chapter 4 discusses the transportation, storage and handling of explosives, while Chapter 5 is on blasting. Appendix A gives some examples of causes of accidents. Appendix B gives a list of important books on explosives, for the use of those who wish to extend their knowledge. Finally, Appendix C contains the Ontario regulations for the storage and handling of explosives.

The book is a clear and concise manual for practical use, and will be of much service to miners and those in charge of mining and quarrying operations. It is carefully written, and is based on the best authorities, interpreted in the light of practical experience.

BOOKS RECEIVED.

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

"Records of the Geological Survey of New South Wales. Volume VII, Part 1, 1900." Sydney, N. S. W.; Government Printer. Pages, 32; illustrated.

"A Century of Copper. Part II." By Nicol Brown and Charles Corbett Turnbull. London; Effingham Wilson. Pages, 120. Price (in New York), \$1.75.

"Thirty-first Annual Report of the State Board of Health of Massachusetts." Dr. Samuel W. Abbott, Secretary. Boston; State Printers. Pages, 812.

"Japan. Report of the Director of the Imperial Mint, Osaka, for the Year ending the 31st of the 3d month of the 33d year of Meiji (March 31st, 1900)." Tokyo, Japan; printed by the Insetsu Kyoku. Pages, 40; with tables.

"Geological Survey of Canada. Report on the Country Traversed by the Yellow Head Pass Route from Edmonton to Tete Jaune Cache." By James McEvoy. Ottawa, Canada; Dominion Printers. Pages, 44; with map and illustrations.

"Geological and Natural History Survey of Minnesota. Final Report, Volume V. Structural and Petrographic Geology of the Taconic and Archean." By N. H. Winchell, State Geologist. St. Paul, Minn.; published by the University of Minnesota. Pages, 1,028; illustrated.

"History of the Currency of the Country and of the Loans of the United States from the Earliest Period to June 30th, 1900." Prepared by William F. De Knight, under the direction of J. F. Tillman, Register of the Treasury. Second Edition, with Appendix. Washington; Government Printing Office. Pages, 278.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials will only be published when so requested.

Letters should be addressed to the MANAGING EDITOR. We do not hold ourselves responsible for the opinions expressed by correspondents.

Electric Plants for Treating Ores.

Sir: There is a great opening in the West for an electric process for extracting metals from their ores. A plant that could be installed near the mine, even though at a greater cost than the smelting furnace for extracting the metal, less freight charges to the furnace, would certainly meet with big sales. Through this part of the West the cost of operating could be much lessened by the use of water power.

I know of several processes by which bornite, chalcopyrite and other copper ores should be treated practically and economically, but know of no company which would rig up and put in operation such a plant.

If there is such a company in existence I wish to introduce their process, and should be very glad to correspond with them.

S. F. Parr,
Electrical Engineer.

McCammom, Idaho, Nov. 20th, 1900.

The Copper District on Lake Superior.

Sir: I have been much interested in reading an article recently published in the "Engineering and Mining Journal" by an old resident of Lake Superior, Mr. J. F. Blandy, giving his opinions and observations on the vein phenomena of the copper district of Lake Superior. It is unfortunate that the opinions and theories of the old-timers did not more generally find their way into print for more general diffusion among the explorers, miners and capitalists of our early mining history; but the local newspapers were then few, hence, only the results of the examination of a few reached the masses most interested in the development of our mining resources. I look upon it as a great misfortune that the Lake Superior District has lost much of the theories and opinions of such men as Wm. H. Stevens, Edwin J. Hulbert, Samuel W. Hill, Jacob Houghton and others, but their work lives as a monument to their skill and memories.

Mr. Blandy is undoubtedly correct in his theory that the copper in our veins was a component part of the original rocks, call them by what name you will, amygdaloids or conglomerates. Some of them contained the metal in a greater or less degree, while many of them are comparatively barren and of no value under the present conditions. It is useless to form theories as to how the native copper got into these hard rocks, as it is a mystery at present unsolved. I have seen beautiful crystals of quartz from the Toltec and Norwich copper mines in Ontonagon County with drops of water imbedded in them. How came they there? I have seen large crystals of spar from the Ridge Mine in which native silver, copper and epidote were imbedded. I have seen agates from the conglomerate belts of Agate Harbor, in Keweenaw County, and from the Porcupine Mountains in Ontonagon County in whose quartz seams were imbedded fine particles of native copper. How came they there?

In reference to the fissure veins of Keweenaw County, I think Mr. Blandy is correct in placing those at the western end of the point in the first and oldest classes. Those centered around the Cliff, Phoenix and Central mines are undoubtedly the most prolific in mineral, while those farther to the east are more or less barren of mineral, and many of them can be classed only as cross-courses. At the Cliff Mine there are 15 well-known amygdaloid belts which for ages poured their mineral contents into the Cliff's great fissure vein, from which so many thousands of tons of masses of copper have been extracted.

The district included in Mr. Blandy's first class between the North American and the Delaware will yet become a large producer from its fissure veins crossing the Greenstone, while the belts underlying the Greenstone will yet be found highly metaliferous, and it is somewhat surprising that so sanguine, yet conservative, a management as that of the Central Mine should let so large a territory as that owned by them remain unexplored and undeveloped.

I also agree with Mr. Blandy that the copper ore deposits have been placed there since the formation of the native copper deposits. I am inclined to think, however, that time will prove these ore deposits more extensive and regular than at present thought of. I do not believe that the present limits of the great copper range, namely the northern and southern belts of sandstone, contain all the copper veins of the several counties through which it passes. In Ontonagon County is well known that copper-bearing amygdaloid belts exist south of the southern belt of sandstone. In the same county I know of several veins of copper ore from a few inches to 4 ft. wide in the slates and traps north of the so-called northern boundary sandstone of the trap range, and these formations can be traced from the Porcupine Mountains, Ontonagon County, to Houghton County. May it not be that the Whitneyite and Mohawkite recently found at the Mohawk Mine are only branches of some of the ore deposits mentioned, which have broken through and found their way into the softer amygdaloid lodes of the copper range?

We now come to another division of Mr. Blandy's excellent article, that of dividing the mineral range into copper zones. I had not before heard of any of our Lake men making this division of our copper formation, but it has long been a theory of my own. Mr. Blandy's division of the mineral range is substantially correct, although from recent investigation and developments the number of zones or divisions can be increased largely, especially in Ontonagon County. I think Mr. Blandy's zone theory is absolutely proved in the district covered by the Calumet and Quincy Mine formation, which I will divide and call the "Calumet Zone" and the "Quincy Zone." In the Calumet Zone the Calumet conglomerate and Osceola lodes are the rich belts. No other lodes lying to the northeast or southwest have been found in the territory considered worth working, and that the Calumet conglomerate in its course, northeast and southwest, is also devoid of mineral. In the Quincy Zone all the evidence goes to show that the Pewabic Lode is the main mineral-bearing lode of that territory, while the lodes contained in the Calumet Zone are non-mineralized in the Quincy Zone, and vice versa.

Accepting, then, the theory of zones of Mr. Blandy as correct, I desire to call attention to a theory of my own, which is that each of these divided zones of our mineral belt has at or near its central point an apex containing the richest deposit of copper in the belt or belts embraced in the zone, and that the belts as they extend eastward or westward pinch out, or become narrower and much poorer in mineral contents. Here are my reasons for my theory: Take the Calumet conglomerate, for instance. No one will, I think, deny that the Calumet & Hecla to-day has all that is valuable in that wonderful lode in its extension northeast and southwest. At the Centennial, to the northeast the lode is too barren to work at a profit; also at the southwest extension on the Osceola. The Calumet Lode elsewhere has been found barren, except in its downward course at the Tamarack. At the Franklin, Jr., a drift was driven south and east until it cut the Calumet Lode and it was found absolutely barren. This drift was extended until the

Osceola Lode was cut and it, too, was found barren of mineral, thus proving that the Calumet and Osceola companies have the rich zone and apex of the Osceola lode as well. Take again the Cliff Zone. I think no one will deny that the Cliff Mine had the richest part or apex of the rich deposit of copper embraced in its territory. Then take again the Pewabic Lode at the Quincy Mine, which now includes the old Pewabic Mine, from which the lode takes its name. History repeats itself, and the Quincy has about all that is valuable of the Pewabic Lode. I omit the Franklin, as they have practically worked out the Pewabic Lode to their boundary line. At the old Hancock Mine, which adjoins the Quincy to the south and west, the Pewabic Lode pinched out and never paid for working. No one will claim that in the extension of the lode to the northeast anything has been opened or worked that is as rich as the Quincy, which surely has the apex of the Pewabic Lode and Zone.

Again, take the Minnesota Mine, in Ontonagon County, meaning the "mother of mines," now the Michigan Mine, and once known as the richest copper mine in the world, and which will yet sustain that reputation. Here we find that the territory embraced in the Minnesota and the eastern portion of the National Mine contains the apex of the rich belt known as the Minnesota Lode. The Rockland Mine adjoining to the east never produced the copper the Minnesota did, and so far the western portion of the National Mine has failed to show the rich ground found in the Minnesota. Surely these proofs of actual and long-continued mining on the lodes of the several mines mentioned sustain my theory.

I will venture the following predictions: That the rich part of the Carp Lake (Ontonagon County) cupriferous sandstone belt will be found in the present Carp Lake Mine and immediately adjoining lands. That the rich part of the Norwich epidotes will be found in the Norwich Mine and immediate adjoining lands. That the rich part of the several lodes of the Evergreen Range will be found in the territory embraced in the Adventure, Toltec and Ridge mines. That the rich part of the Winona Lode will be hereafter found in the territory embraced in the Adventure, Toltec and Ridge mines. That the rich part of the Winona Lode will be found in the Winona Mine and the adjoining territory to the southwest. That the Champion and Tri-Mountain mines have the rich part of the Baltic Lode, the Baltic having only part of it, as the lode pinches out in a northeasterly extension. That the Isle Royale and its adjacent territory to the southwest will have the richest zone or apex of the cupriferous lode known as the Isle Royale. Its extension to the northeast, as proven by work at several properties, shows that it is too low-grade a proposition to work at a profit. But the lode is such a strong and persistent one that it will be opened and worked on some of the properties lying farther to the northeast at no very distant day, but at what point I would not venture to say. That the Mohawk is the rich apex of the belt of the zone to which it belongs. That the Central Mine and properties immediately west will yet be found to be in a rich copper zone of the belts underlying the Greenstone.

These are theories, deductions and predictions made after much observation and study of the vein formation of our copper district for over 40 years. Time alone will prove if correct. They may serve as a line of thought for the younger generation to examine and study, for on their shoulders will fall the work of developing the vast hidden resources of this favored mineral district.

Alfred Meads.

Marquette, Mich., Nov. 20, 1900.

QUARRYING ROAD METAL IN GREAT BRITAIN.—The development of tramways and the large expenditure of county councils on main roads have together enormously enhanced the demand for stone-paving sets and macadam material generally, says the London "Colliery Guardian." In the Midlands, nothing has so far been found so well adapted to the purpose as the basic series of igneous rocks which are found in Staffordshire. These rocks consist almost exclusively of dolerites or basalts, the latter being merely a fine-grained variety of the former. They are intruded among the coal-measures and shales, the original mineral constituents being crystals, augite, olivine, magnetite, ilmenite and apatite. The Hailstone Hill, near Rowley, the Powk Hill near Walsall, the Titterston Clew Hill, Knowle Hill near Kinlet, and Swinerton Park near Stafford are the leading centers of this valuable stone deposit. The quarrying of the stone is in several places materially facilitated by the use of stone-breaking machinery, and for some considerable time past the supply has been unequal to the demand.

THE FIRST STONE ARCH BRIDGE BUILT IN THE UNITED STATES.—The first stone bridge with ring stones built in the United States is claimed by the town of Ipswich, Mass. This bridge, while not of great magnitude, consisting of two spans of about 28 ft. each, has an interesting history and reflects no little credit upon its builder, says the "Railroad Gazette." The structure is situated upon South Main Street, where it crosses the Ipswich River. The sidewalk is about 6 ft. wide and the roadway 22 ft., one side of which is occupied by a single trolley car track. In 1838 the bridge was widened 12 ft., making the original width between parapets about 16 ft. The material is granite hewn or split from boulders collected from the fields near by. The inscription cut in a large stone at one end of the sidewalk parapet reads, "Choate Bridge. Built by Town and County, 1764."

Col. John Choate, the builder, must have possessed considerable courage to attempt such a structure, for, like all innovations, it was ridiculed by many from the start. When the time drew near for the falsework to be removed public opinion ran so high against the bridge (which was deemed unsafe by a large number of the citizens, and by some even it was contended that it would not stand under its own weight) that Col. Choate, to save his life in case the bridge failed, had his horse ready to take him out of the district. His precautions were needless, however, as the bridge did not fall and has been in constant use up to the present time. It trembles a little under a heavy team, but will doubtless give good service for many years to come.

A CALIFORNIAN'S IMPRESSION OF NOVA SCOTIA GOLD MINING.

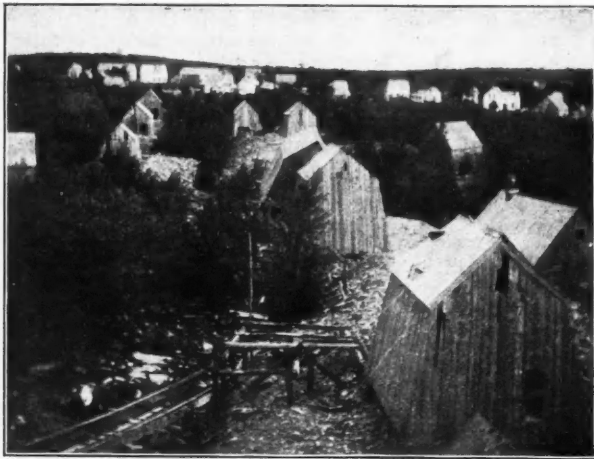
Mr. Sidney Smith, one of the owners of the Lucas Mine in Calaveras County, California, has been spending some months in Nova Scotia, and writes us his impressions substantially as follows:

There are some good gold mines in Nova Scotia and the gold is worth \$19.75 per ounce. The veins are small, but carry values from \$20 to \$60 per ton, free milling. The miners in this section are behind the times; they work no concentrators as a rule, and use the old high-slow discharge in their mills; consequently large values are lost in the tailings, which are high grade, and can be treated chemically, or chlorinated at a profit. I have secured all the available dumps in the Province and intend to work them in the spring by a chemical process, with concentrators on some of the dumps.

The methods of working mines here is a novelty to a Californian. For instance, a shaft is sunk 100 ft., then a drift run on the ledge 50 ft. and another shaft sunk the same depth and the vein worked out to the surface by underhand stoping (old bench stoping). They then continue sinking shaft. I have seen 10 shafts in 1,500 ft. on a vein, some 60 ft deep, others 120 ft. or so.

I send you a photograph (No. 1) of a mine with 10 shafts with small houses over each one, worked by wire rope or a friction wheel from the mill, which is operated by water power obtained from the stream. You will see in a line, three shaft houses, and three in a line parallel with that, for the reason that there are parallel veins here about 50 or 100 ft. apart, and these small houses are all shaft houses. Deep shafts are not sunk and no crosscuts are run in the whole country.

I think if worked as our California mines are worked, the mines would pay large dividends. The veins average from 4 to 15 in. in a granite formation and in slate, about 2½ ft. between walls. No water is in the mines, except that caught from the surface. They have in



MALAGA MINES, NOVA SCOTIA.

one mine, which has a 40-stamp mill, paying \$8,000 per month, a large vein of \$3 rock, and in another there is an 8-in. vein of \$50 rock which pays \$10,000 per month. The Government exacts a fee of 2 per cent. on all gold produced. Very few Americans are here.

I also enclose a photograph (No. 2), which shows the mill and tailing dump of the Lakeview Mine at Waverly, N. S. This dump contains 30,000 tons, which assay from \$3 to \$7 per ton.

DIAMONDS FOR DRILLING.

According to Mr. J. H. Ehrmann in "Boring and Drilling," South Africa is now the chief source of supply for diamonds for industrial purposes, as well as for those used as gems. Besides the De Beers Mines diamonds are obtained from Jagersfontein and from washings on the Vaal River. The De Beers diamonds are neither so hard nor so white as those from Jagersfontein. The diamonds obtained from the latter place are of a bluish-white color, which is one of their chief characteristics. The borts, on the other hand, are of a darker color and exceedingly hard. The Vaal River diamonds are very similar to those of Jagersfontein, but many of them have become water-worn, while they are also impregnated with a trace of oxide of iron which is seen in the tinge of red visible in them.

In regard to Brazilian diamonds they run in much smaller sizes, large stones being very rare, though the quality is often very fine. Brazilian mines also are the only producers of the carbon or black diamonds, none of this description being found in South Africa. Australian diamonds are also very small in size, and rarely exceed 1 carat in weight, but are of a very hard composition. The size of African diamonds varies very considerably; much more so than is the case with the Brazilian. Diamonds are used for boring, drilling, diamond polishing, wire drawing, stone sawing, glass cutting, engraving, etc., and for each purpose a different description of stone is necessary.

As to the great rise in the price of diamonds during the last few years Mr. Ehrmann states, that it has more than doubled from what it was 10 years ago, a movement which he attributes to the consolidation in the diamond mining industry, and to the great increase in the demand for the diamonds themselves, particularly for the United States.

Diamonds are found in their natural state in a great variety of shapes, which are known in the trade as crystals, meles, cleavages and borts, and the value of the diamond for the different industrial purposes is greatly dependent on its shape. For instance, for boring and drilling,

round hard stones are much the best. For wire-drawing, a flat stone is most suitable and most valuable, while for stone sawing, angular diamonds are preferable to any others.

THE SICILIAN SALT INDUSTRY.

According to a report of the British Vice-Consul, the yield of salt made in the Trapani salt works last year amounted to about 200,000 tons. The salt exported from Trapani was 107,566 tons, against 85,462 tons in 1898. The number of salt works actually existing in the Trapani District is 45, occupying an area of about 10 square kms., and nearly all the shore from Trapani up to Marsala. The salt works are all private property, and the government monopoly, which is strictly enforced in all continental Italy, does not exist in the island of Sicily.

The process of making salt is yet very primitive, but owing to the settled state of the climate during the months of July, August and September, and also the purity of the sea water, the yield is, with rare exceptions very abundant. Upon an average the quantity of salt produced in one year in all the works is about 200,000 tons. The best conditions for making salt are dry and clear weather accompanied by a light breeze; the wind by agitating the surface of the water greatly helps the precipitation of the salt to the bottom of the pans and the evaporation of the water.

All the area of a saline is occupied by pans, except a small space for a house and stores. The pans are employed for various uses, and in a well-constituted saline must occupy no more than one-seventh part of the whole area. Other pans are destined for preparing the waters, which occupation is a constant care during the whole year. When the water is first taken from the sea it is passed into a pan called "Fredda" (cold), and then gradually passes into other pans until it is collected into a pan called "Calda" (warm); at first the water contains very little salt. By evaporation it becomes more impregnated, containing less water and more salt, and when it reaches the "Calda" the temperature is 30° or 35° C., at which point it is ready for making salt, and when the proper season



LAKE VIEW MINE, WAVERLEY, NOVA SCOTIA.

comes, with a large quantity of this water ready, a few days are enough to do the necessary work and obtain the product.

The salt pans are quadrilateral in form, measuring about 30 m. square; each side is 40 cm. high; the bottom or bed may be of mud or sand; the oldest pans have always a mud bottom, but it is so hard that a man can walk on it without leaving any trace of his steps, and water will not be absorbed by it. The system of making sand bottoms is relatively recent, the first trials having been made not later than 50 years ago, and since then the transformations have always increased every year. When the salt is made on sand-bottomed pans, it is much cleaner and whiter, but it always contains a little sand. It is generally admitted that the older a saline is the better is the quality of the salt produced, and this is due to the bottoms of the pans, which much necessarily be hard and well consolidated. All salines are provided with windmills, which are used for passing the water from the sea into the pans, and also for grinding the salt. Ground salt is never exported, but is only used for local fisheries and other purposes in Sicily.

When there is no more water in the pan the men proceed to collect the salt in small heaps, each one corresponding to the contents of six large baskets, and in this state it is left to dry for about 24 hours. It is then removed from the pan, and piled up in a rectangular heap, which, as soon as possible, is covered with tiles to preserve the salt from rain and dust. Each heap may contain up to 300 tons of salt. All the salines are divided by channels, which give access to the lighters. The channels are not very deep, nor are they kept clean. A salt pan gives three, four and sometimes five crops during the season, which is considered finished when rain commences in the autumn, and when nights are becoming so long and so damp that the progress obtained during the day is counteracted during the night time.

Three qualities of salt are produced, which are respectively called first quality fine grained Trapani salt; first quality coarse grained Marsala salt; best ground marine salt. The fine grained quality is made in all the salines which are situated in the neighborhood of the town and its port, and the coarse quality is produced in those salines which are nearer to the town of Marsala; but the salt is always shipped in the port of Trapani, and all the salines belong to Trapanese proprietors.

The salt is exported to Norway and Sweden, Finland, the United States of America, Newfoundland, Nova Scotia, Canada and other countries; and it is principally employed for curing or salting fish. Prices are very variable. Sometimes special occurrences, which take place in a country, are the cause of a great reduction in prices, as, for instance, the Spanish-American war, which caused the Spanish exchange on gold to go up to

the high rate of 70 per cent. and more, and therefore the Norwegians, who import every year large quantities of salt for their fisheries, took advantage of the situation by buying all the salt then existing in Iviza (Balearic Islands). The difficulty of finding tonnage is sometimes the reason why many orders cannot be executed, and the salt consequently remains accumulated for years.

It has been the custom for a very long time to export salt to the United States in sailing vessels, which, rather than go across in ballast, prefer to charter at a low freight, getting enough to pay their pilotages, tugs and other expenses; but now wooden vessels are scarce, and the insurance companies decline to insure the cargoes of salt if ships are not first class. The rate of freights generally offered are as follows:

New York, \$1.44; Boston, \$2.16; Gloucester (Mass.), \$2.28 to \$2.40, and Halifax (N. S.), \$1.80 to \$1.92. The salt is sold free alongside in the port of Trapani, all expenses and export duty included.

The loading is done by steam winches, and large steamers can load by six or eight gangs. Old petroleum barrels are employed to ship the salt, and the work is generally executed very quickly; some merchants are able to supply nearly 1,000 tons daily; others, though they are also large producers, cannot give more than 500 or 600 tons daily, because their salines are situated far from the port, and they much depend on circumstances, principally on contrary winds or calms, which delay the lighters. The usage of the port is 200 tons per day, and no merchant will engage himself to supply steamers with a larger quantity.

Salt at Trapani is sold by the salma, a measure of 18 large bushels, the weight of which varies according to the saline where it has been produced, and depends also on its dryness. Upon an average, 1 salma of salt weighs about 480 kgs., although some special kind of fine-grained salt reaches even 510 kgs. to the salma. When the salt is sold in Norway, Sweden or Finland, the salma is guaranteed to be not less than 3% Norway barrels.

The salt pans, as has been already mentioned are private property, and no income tax is paid on them. The taxes imposed are the "Fondlaria" and "Fabbricata"—land building taxes—which amount to 33 per cent. on the net revenue; besides this, the proprietor of a saline has no other expenses, except those for the production of salt, the lighterage alongside ship, and the export duty, which is paid according to the register tonnage of the ship, increased by 50 per cent. The average cost per salma is production, 0.80 lire; lighterage, 0.45; loading, 0.40; duty, 0.11; total, 1.76 lire, or about 24c. The selling price has varied, the highest obtained being 4 lire, or 77 c., per salma, in 1892, 1893 and 1898; the lowest, 2.80 lire, or 54c., in 1899.

DEOXIDIZING STEEL CASTINGS.

A German process, lately taken up by the Krupp Company, is operated as follows, according to the London "Iron and Coal Trades Review": An alloy of aluminum, manganese, silicon, and iron, in which the manganese and silicon are in the form of ferromanganese and ferrosilicon, is first prepared, the proportion of the elements in the finished alloy being 5 per cent. aluminum, 10 per cent. manganese, 10 per cent. silicon and 75 per cent. iron. This alloy is added to the molten steel in such proportions that practically only a trace of the constituent of the same, or at least less than one-tenth of 1 per cent., remains in the finished casting, it being of course understood that the iron added by the alloy is in such proportion that more or less of the same is not oxidized and remains in the finished casting, while the remaining elements of the alloy are practically completely oxidized and form a readily fusible slag. The actual quantity of the alloy added to the molten iron or steel will, of course, depend on the amount of oxygen found to be contained in the iron or steel. Under ordinary conditions, from 0.5 to 0.8 per cent. of the alloy is added in the treatment of basic steel.

The addition of the molten metal for the deoxidation or reduction of steel or iron castings may consist simply of a single metal having a greater affinity for oxygen than the metal under treatment, such as aluminum, combined with a non-metallic slag-forming substance, such as silicon; but it is generally of advantage to employ at least two metals as an addition, in order to produce double or multiple silicates, which form a much less refractory slag than the single silicate does. For this reason, in the above example in the treatment of steel, use is made of two metals—to wit, aluminum and manganese. If the manganese be omitted from the alloy above set forth, it is still probable that a double salt consisting of aluminum-iron silicate will be formed. However, the presence of manganese positively insures the formation of a readily fusible slag.

RHODIUM ALLOYS.

A specimen piece of pure rhodium wire, exhibited by Heraeus, of Hanau, at Paris, indicates that this metal has only quite recently been prepared in sufficient quantities to study its metallurgical character, although platinum-rhodium thermo-couples have been used for several years, says London "Engineering." Great attention is now being paid to the nature of alloys, and the rhodium alloys are not less interesting than others. According to Dr. Roessler, of the Gold and Silver Refinery of Frankfurt-am-Main, rhodium appears to have been confused with iridium in some cases. We have two groups of platinum metals, the one with a specific gravity of about 12, the other with a gravity of about 22. Rhodium belongs to the first group, iridium to the second. If 5 milligrams of rhodium are fused with 1 gram of silver, melted in lead, the regulus resulting from cupellation is not bright as silver, but dim gray. When the grain is dissolved in nitric acid, this gray film disintegrates into fine, glittering scales which float in the solution. These scales are fine hexagonal crystals of pure rhodium. When more rhodium is applied, it is afterward re-obtained in the amorphous state. There is, therefore, no alloy of rhodium and silver, and rhodium is not soluble in silver, but it is soluble in lead. Iridium behaves similarly. The silver-iridium grain, resulting when the above-mentioned proportions are observed, has the bright color of silver, the much heavier iridium particles are imbedded in the bottom of the grain, and when nitric acid is applied

as solvent, the iridium is again found crystallized, but the crystals rapidly sink in the solution. Large proportions of iridium are not dissolved by the silver, and remains amorphous. On continued heating, the iridium becomes oxidized.

The case is quite different with silver and platinum. These two metals alloy, and when such an alloy containing only a small proportion of platinum is dissolved in nitric acid, some of the platinum, which is itself insoluble in nitric acid, passes into solution with the excess of silver. Further, the platinum residue proves oxidized, and is then soluble in hydrochloric acid. Thus, an observation of Von der Ropp's is confirmed, and it has in fact, been known that the anode mud, obtained in silver refineries from silver containing both gold and platinum, on the Moebius process, leaves an oxidized platinum residue behind, soluble in hydrochloric acid. Ropp found water, oxygen and nitrous acid in this residue. The rhodium gold alloy resembles this platinum silver in these respects. It is prepared like the rhodium silver alloy, and dissolves in aqua regia with a darker color than gold alone would give.

The properties of rhodium are evidently influenced by a large excess of gold. If more rhodium (above 5 per cent.) is forced into the gold, which requires long-continued fusion, the excess of rhodium is afterward found in beautiful star-shaped or feathery needles, easily distinguished from the gold by their gray color. Gold and rhodium seem to form a real alloy, but it has not been isolated so far. To investigate the question further, Roessler prepared alloys of rhodium with bismuth, tin and antimony. The metals have to be heated above their melting points for some time. Bismuth takes up 5 per cent. maximum of rhodium. When the excess of bismuth is extracted with cold nitric acid, crystals of Rh Bi remain behind, which are themselves soluble in boiling nitric acid. The same crystals can be prepared by fusing together the respective proportions of the two metals corresponding to that formula, and those crystals are entirely soluble in hot nitric acid; no bismuth can then be extracted with cold acid. Any excess of rhodium is afterward found in the crystallized or in the amorphous state; the amorphous metal had evidently not been taken up by the fused mass.

NEW SAFETY STOP FOR MINE CAGES.—In a safety arrangement for sustaining mine cages in the event of breakage to the rope, devised by Herr F. A. Munzner, of Obergruna, near Siebenlehn, Silesia, eccentrics are set with knife-like teeth which, both by penetrating into the wood of the guides during the turning of the eccentrics on their axles, and also by the alternate driving apart and pressing together of the wood fibers while so turning, bring about a gradual arrest of the cage without shock.

OCHEER IN GERMANY.—United States Consul-General Mason writes from Berlin, November 9th, 1900, that he has received a sample of crude ocher from Texas, which he requested in a previous report. Mr. Mason adds: "This sample I caused to be divided and distributed among several of the leading consumers of yellow ocher in Germany, who, after examination, report unanimously that the tint and quality of the ocher are alike excellent, but that it should be prepared for market by being first washed free from sand and other impurities, then dried, pulverized and put up in wooden casks. In this condition it would meet with a ready and extensive sale in Germany, where its wholesale value would range from \$19.44 to \$21.87 per metric ton, including casks, c. i. f. Hamburg. The process of washing ocher is simple and well known, and therefore requires no explanation. As above indicated, it will be necessary, in order to introduce this new product into this country, that the exporters shall provide for its transportation to a German port—preferably Hamburg or Bremen—and give a definite price free on board at one or other of those ports. It is impossible for importers in this country to ascertain freights or provide charters from a port on the Gulf of Mexico to Germany. That belongs to the exporter, whose product will in the present case have to compete with French ocher, which has for many years controlled the market in Germany."

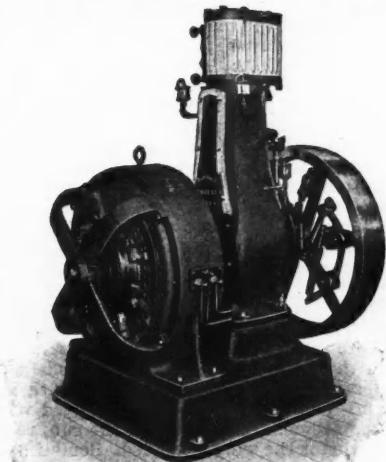
MECHANICAL DRAFT AND ITS ADVANTAGES.—Within the past few years there has sprung up a decided sentiment in favor of forced or induced draft in land installations. The fitness of this form of draft for marine work, where tall chimneys are to be avoided, is readily conceded, and, following the precedent there established, the use of mechanical draft is extending to stationary plants. Natural draft depends upon the difference in temperature between the gases inside and outside the chimney, and is greater accordingly as the smoke and gas from the furnace pass out in a more highly-heated state. But this entails a great loss of heat which might otherwise be used to better advantage. The introduction of an economizer into the flue space has the effect of absorbing some of this excess heat and returning it to the boiler through the water. Yet even the economizer dare not consume too much, or the temperature of the flue gases will be so much reduced, as to seriously impair the effect of the draft. By means of a fan or a centrifugal blower, however, the combustion can be made more nearly perfect, owing to a nicety of regulation of the air supply, and therefore the gases will reach their maximum temperature. The economizer may then absorb every unit of heat that escapes into the stack, if possible, without detriment to the draft, since the pressure from the blower furnishes this. By this combined installation of economizer and forced draft a saving of 15 per cent. has been made in cases where fuel was dear and the feed-water low in temperature. It costs less to instal a mechanical draft apparatus than to build a suitable chimney for natural draft. And then it is possible to secure a more complete utilization of the waste heat than by ordinary methods. Poor grades of coal may be used, in connection with mechanical draft, to great advantage, thus lessening the cost of coal supply. Again there is no chance of the efficiency of the draft being influenced by the weather. If the draft tends to become weak the fan may be speeded up to keep it uniform, and if, under the stress of some sudden emergency, it is found necessary to generate more steam in a very short time, an increase in the force of the draft, directly under the control of the engineer, makes a quick response to the demand.

A DIRECT-CONNECTED GENERATING SET.

Economy of steam consumption is, of course, a most vital consideration in the performance of an engine, for upon that depends the coal bill. It often happens, in addition, that installation conditions demand economy of floor space. The accompanying illustration shows a type of engine fulfilling both these requirements in the highest degree. It is a standard upright Class A engine, manufactured by the Buffalo Forge Company, of Buffalo, N. Y., and in this case is connected to a generator of the Triumph Electric Company's make, though it will be understood, of course, that any standard dynamo may be so connected. The rigid cast-iron frame of the upright enclosed type has one cylinder head cast a part thereof, and to this are bolted the cylinder and steam chest, though in the smaller sizes the cylinder also is cast on a frame. Cylinder and guides are bored with the same setting of the boring bar, so that perfect alignment results. The material employed throughout is the very best obtainable, while the workmanship is high in like degree.

A unique feature of this upright engine is that it is enclosed to run in oil, so that perfect lubrication of the main bearings, crank pin, wrist pin and guides is assured. Other bearing surfaces are cared for by continuous oilers of large capacity, and for the cylinder and steam chest, a large sight feed lubricator is provided. As a result of this thorough system, smooth running at continuous high speeds is readily possible. Another feature which renders this engine valuable for high-speed lighting and power service is close regulation. This is afforded by a centrifugal fly-wheel governor of great sensitiveness. The latter property follows in part from the careful design, which provided three means of adjustment for the governor, and in part, also, from the provision of ample lubrication for all the governor pins and rubbing surfaces of the valve motion. The valve, it may be added is of the piston type, perfectly balanced.

In view of the illustration herewith shown, it is hardly necessary to



BUFFALO UPRIGHT DIRECT CONNECTED ENGINE.

comment upon the extremely small floor space required for such a generating set. This feature has resulted in the extensive application of the Buffalo Forge Company upright engine to marine service, where the requirements are especially severe. The machine in question has a range of sizes from 4 to 100 H. P.

THE NEW MINING EXCHANGE BUILDING AT COLORADO SPRINGS.

By Our Special Correspondent.

Within six months time the Colorado Springs Mining Stock Association will be transacting business in its new building. This building has been in course of construction for six months, and it will be ready for the purposes of the Exchange by June 1st, 1901. While the building is Mr. W. S. Stratton's property, he has named it the Mining Stock Exchange, and he erected it with the purpose of giving the Mining Stock Association facilities adequate for the transaction of its large business.

The arrangement between the parties was a very simple one. The old Exchange quarters had become too cramped and the association needed a building in keeping with its position. Mr. Stratton owned a piece of unimproved property in a location adapted to the purpose, and the association gave him assurances which were sufficient to protect him from a business point of view. The association agreed to take a lease on a portion of the building for a period of five years.

The building is a pretentious structure. The exterior architecture is severe but impressive. The interior will be simple but elegant. In the finish of the Exchange hall, blue-veined, white Italian marble will be the most conspicuous decorative feature, the walls, ceiling and columns being entirely of that material. The Exchange hall will be 50 by 65 ft. in size, two stories high, and will be almost in the center of the building and on the first floor. The exterior walls of the building are of gray granite to the second story, and the remainder of terra cotta. It is five stories high, with a frontage of 100 ft. on Pike's Peak Avenue and 170 ft. on Nevada Avenue.

Aside from the Exchange hall, the first floor will be occupied by a trust company and several of the large brokerage firms doing business on the Exchange. The remaining four floors will be arranged for offices,

of which there will not be less than 250. When completed, the building will represent an investment of \$300,000.

The growth and present magnitude of the mining stock business of Colorado Springs is one of the incidents of the development of the Cripple Creek District. More shares of mining stock are bought and sold on this Exchange than in any other city in the world, and in only two other cities—London and Boston—is the aggregate cash value of the transactions larger.

In Colorado Springs there are some 200 firms and individuals in the brokerage business, and directly and indirectly not less than 1,000 people are engaged in it. The mining stock business here is of a wholesome and conservative character. Investors have depended for returns on the value and output of the mines and not on the manipulations of rings and companies. Wildcats are not accorded any favor. There have therefore been no scandals, sensational failures nor suicides associated with its history. In short, the Mining Exchange and the stock business of Colorado Springs generally are conducted on a high plane and in line with the best business methods.

TAPERED MINE PROPS.

The accompanying illustrations, from the London "Colliery Guardian," show the use of mine props tapered at the lower end, the use of which has been advocated by the designer, Mr. W. H. Hepplewhite, in Great Britain. He claims that as the superincumbent strata settle, instead of bending and breaking the prop, the tapered end, being the

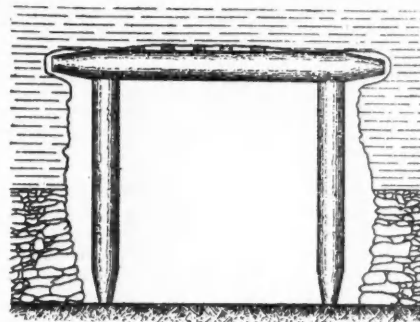


FIG. 1.

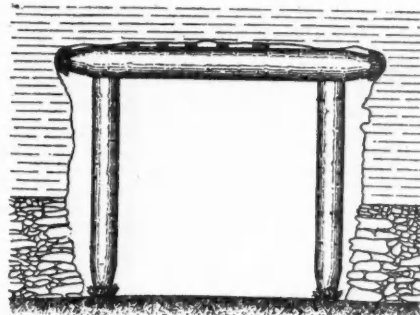


FIG. 2.

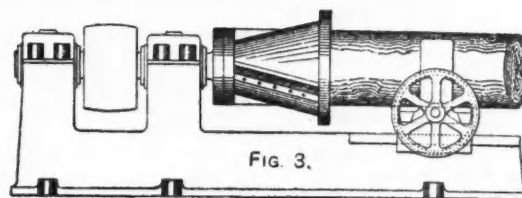


FIG. 3.

TAPERED MINE PROPS.

weakest point, will give way gradually, the point burring and the prop remaining erect and unbroken. When the time arrives for its withdrawal the timber will be found erect and unbroken. Supposing that the burring has advanced 4 to 5 in. along the taper, the timber can be reset in the same stall on a foot-lid and the burring will proceed again on the same principle. In fact, it follows that so long as a weak point is made at the end of the prop, and rendered relatively weaker than the other portion, the prop may be reset in suitable places as long as there is length to set. Finally, when too short for use as a prop, it can be cut up for lids or sleepers. Bars or stretchers having both ends treated similarly to the props, the ends being relatively weaker than the middle portion, would burr, thus saving the timbers from breakage and at the same time more securely supporting the roof. The tapering can be done either by manual labor or machinery at a small cost.

Fig. 1 shows the use of tapered bars and props, and Fig. 2 illustrates the result. Fig. 3 is a sketch of a machine for tapering props fitted with removable knives. It has a traveling table, similar to the table on a pipe screwing machine, controlled by a rack and pinion. The prop is secured to this table by a clamp, with right and left-hand screws. Each machine will taper about 30 props per hour, and about 4 H. P. is required to drive it.

SLATE IN INDIA.—The production of slate in India is given by the Government returns for 1899 at 9 tons from the Northwest Provinces; 6,982 tons from Madras; 17,914 tons from Rajputana; total, 24,905 tons. In 1898 the total was 26,530 tons, showing a decrease last year of 1,625 tons, or 6.1 per cent.

THE COAL-FIELDS OF NATAL.*

By Wm. Taylor Heslop.

The coal-measures of South Africa are usually considered to belong to the Triassic formation, but their precise geological horizon can by no means be regarded as definitely determined. South African coals may be divided into three classes, as distinguished by the appearance of the coal alone: (1) Bright coal, similar in appearance to British bituminous coal, showing a cubic cleavage, but with more distinct horizontal lamination than British coal. (2) Dull coal, similar to splint coal, with cubic or irregular cleavages, but often with a coarse grain, and always with a much higher proportion of ash than the bright coal with which it is immediately associated. (3) Semi-bright coal, a fine-grained coal with a conchoidal fracture and no lamination. In appearance it resembles some of the Welsh or Irish anthracites, but it has a graphitic luster. It contains from 25 to 35 per cent. of ash. The upper unworked portion of the Clydesdale (Transvaal) coal seams forms a good example of this variety. The dull coal and bright coal are often found inter-laminated, the one gradually merging into the other. It is a noteworthy feature of the South African coal-fields that where the seams are abnormally thick there is a greater proportion of dull and impure coal, and such seams are less constant in character and continuity than the seams of medium thickness. Thus the seams of Natal, which are comparatively thin, contain much less dull or impure coal, and are more uniform in character than those of the Transvaal.

The Natal coal-field occupies the northern portion of the colony, forming a triangle of which the base is a line drawn east and west, about 12 miles north of Ladysmith, and the two sides are, approximately, the boundaries of the colony to the north of that line. The average elevation above the sea is about 4,000 ft., although near Laing's Nek coal is found almost 5,000 ft. above sea-level. During September, 1899, the last full month's working before the commencement of the war, the total output was 40,351 tons. Of this quantity 19,407 tons were sold for bunker trade at Durban, and 508 tons were exported. In its production 128 Europeans, 1,678 natives, and 878 Indian coolies were employed.

The Dundee Collieries occupy the leading position among the producing mines. Coal has been worked there during the last 30 years, although not to any great extent until some 10 years ago, when the output reached 4,000 tons per month. The coal has the following average analysis: Volatile matter, 16.63; fixed carbon, 70.53; sulphur, 4.18; ash, 8.66. Although higher in sulphur and ash than some of the competing coals, the larger proportion of fixed carbon enables it to hold its own.

The Natal Navigation Collieries are situated about 4 miles from the Natal Government Railway, with which they are connected by means of a branch line. The analyses of the coal which have so far been made are unreliable, but the coal undoubtedly contains at least 25 per cent. of volatile matter, and less sulphur than the Dundee coal; unfortunately, it is very friable and will not stand handling without breakage.

The St. George's Colliery Company holds ground both east and west of the Natal Navigation colliery, but the working of the eastern part was abandoned and operations are now conducted on the western side. The occurrence of an explosion last year hampered the development of the mine, and the profit-earning stage was reached only a month or two before the commencement of the war. In quality, the coal is almost the same as the Natal Navigation coal, but it is not so friable.

The Elandslaagte Collieries, the only productive coal-mines situated south of the Biggarsberg, possess the advantage of being nearest to the market, which compensates for the thinness of their seams and the slightly inferior nature of their coal.

The Natal Marine Collieries are situated about 2 miles east of Dundee, and are the most recent producers in the colony. By extensive boring, an area of about 1,000 acres of coal, similar in section and quality to that of the Dundee collieries, and lying for the most part very near to the surface, has been proved. Although the coal had only been in the market a few months when the war broke out, it had already acquired a very good name and ready sale.

The New Campbell Collieries.—Unfortunately, the main shaft of these mines was located within 100 ft. of an enormous dolerite dike, and where the coal was struck it only contained 4 per cent. of volatile matter. After 1,400 ft. of driving, at right angles to the dike, bituminous coal of very good quality had just been proved when work was suspended.

The South African Collieries were promoted by the De Beers Mines, with the idea of ultimately supplying coal to the Kimberly market. In sinking the shafts, a horizontal sheet of dolerite, or whinstone, 153 ft. in thickness was penetrated. The rock was so hard that progress was slow. Coal was struck at a depth of 360 ft., or 86 ft. below the bed of dolerite, and gave the following analysis: Volatile matter 8.6; fixed carbon, 79.7; ash, 9.7; water, 2.0. The percentage of sulphur in the ash was 3.35. Boiler tests, though variable in results, were not sufficiently satisfactory to justify further work at that point, and it will probably be found necessary to sink fresh shafts on one of the bituminous areas within the property, which covers about 16,000 acres.

In the Newcastle District, the Newcastle and East and West Lennox town collieries are furnishing small supplies. The coal in this district contains about 30 per cent. of volatile matter. Some of it is very good indeed, but the seams are more variable in quality and thickness than those of the Dundee district. Between the Natal Navigation Colliery and the town of Newcastle, coal of very good quality and thickness has been proved at a depth of 500 ft. at Dannhauser, in a shaft sunk by the Durban Collieries Syndicate. The top seam here shows 3 ft. 10 in. of coal. The bottom seam shows 4 ft. 2 in. of coal, a parting of 2 in. of shale and below that 1 ft. 3 in. more of coal. The top seam shows 40 per cent. volatile matter; 49.78 fixed carbon; 9.42 ash; 0.80 moisture. The amount of sulphur is not stated. The bottom seam is richer in fixed carbon, analysis showing 31.20 per cent. volatile matter; 57.56 fixed carbon; 10.44 ash; 0.80 moisture.

Up to the present, the bunker trade of Durban furnishes the largest

market for the coal output, the next largest consumers being the Natal Government railways. The railway rate for the transport of coal is 0.9c. per ton per mile, or \$2.16 per ton for the distance of 240 miles from Dundee to Durban. Since February, 1899, to encourage the export trade, a rebate of 33 per cent. on the ordinary rate for all coal exported from the colony has been made. The loading facilities at Durban harbor are meager, all coal being loaded into ships in baskets or bags on the backs of Kaffirs, and at a cost of 36c. per ton. Improved arrangements for loading will be necessary before any great expansion of the export trade can take place. It is to Cape Colony that Natal coal owners are now turning their attention, in the hope of capturing the market at present supplied by Welsh coal. It is estimated that the requirements of the Cape Colony amount to 500,000 tons per annum, which have hitherto been supplied by Welsh coal, by collieries in the Stormberg and Indwe districts of Cape Colony, and from Vereeniging on the Vaal River.

The largest market for coal in South Africa is that of the Witwatersrand Gold-Fields. Hitherto Natal coal has been shut out from the Transvaal by a prohibitive duty of \$1.20 per 100 lbs. When the duty is removed Natal coal must be prepared to pay a railway freightage of from 96c. to \$1.20 per ton over and above that paid by the Middelburg coal. This difference would be largely caused by the freight from the Dundee District to the Transvaal border, and it would not be materially affected by any future re-adjustment of railway rates in the Transvaal. Whether Natal coal is able, on account of its better quality, to carry this rate and compete in the Witwatersrand market with the Middelburg coal much be left for future trials to decide.

MINING MACHINERY IN THE PHILIPPINES.

Written for the Engineering and Mining Journal by G. D. Rice.

In my last letter I spoke generally of gold placer mining in the Philippines as carried on by the natives. It will be interesting to know some of the home-made plans of the natives for getting the gold from the hills. In Fig. 1 we show the bamboo sluices employed. The bamboo is cut full length, often about 60 ft. long, and is split. The halves are then arranged parallel like A, A, A, and adjusted to a cross piece, B. The water is washed through these bamboo sluices under pressure. The specific gravity of the gold is so much greater than that of the sand and other foreign substances that it sinks and catches in the natural riffles formed by the walls which exist at intervals along the interior of the bamboo. The wall is broken and cut down to within a fraction of an inch all around and serves its purpose well.

There is ordinarily plenty of water available in the Philippines, but often the native miners are obliged to convey it from various points by means of bamboo pipes, such as are shown next. This bamboo piping is quite unique and interesting. I have seen miles of it around mountains and through gulleys. It all leaks a little at the joints, and the wood warps and swells under the influence of the water and the heat of the sun. However, some of the water gets through to its destination and this is enough to suit the purposes of the natives. One way of effecting a union in the bamboo piping is presented in Fig. 2, in which the ends of the opposite sticks, C C, are shown with a larger piece of bamboo D over them. Then the crevices are plugged with a soft sort of clay that, when once hardened in the heat of the sun, remains in a baked shape and is serviceable for the work intended. Sometimes these pipes are formed by uniting the ends as shown in Fig. 3 in which an end of smaller diameter, like E, is fitted in one of larger diameter, like F. Then again, some of the natives who have an artistic turn, make the unions on a more intricate plan, as shown in Fig. 4, in which the end, H, is fitted on the dovetail pattern to the end, G. This requires that the adjustment be correct and the work done well, otherwise a botchy job results that leaks badly. In repairing a leaky slit in the bamboo, as at I, the natives wind the portion with hemp cord, drawing it so tight that an ordinary leak is closed.

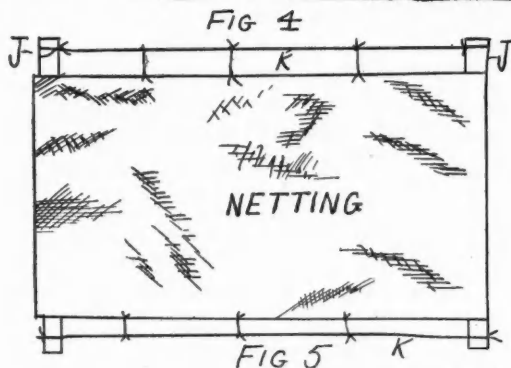
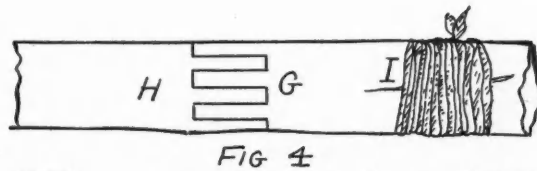
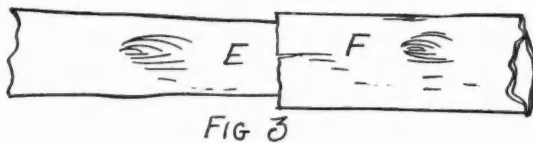
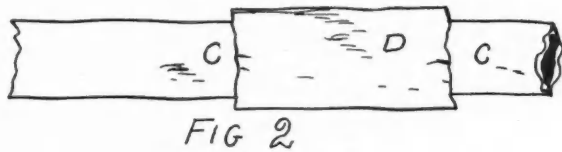
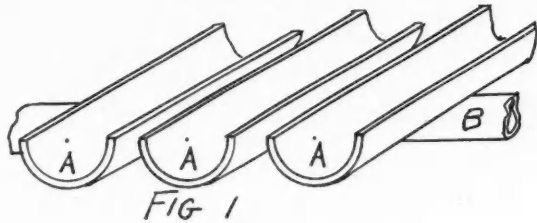
The natives have an ingenious plan for getting hold of some of the so-called "invisible" gold. The "color" may be quite absent and it would seem hardly worth while to work the material. Yet by means of a hempen netting, like that in Fig. 5, considerable of the yellow metal is secured. The netting is very cheap, being made on the hand looms of the islands, from hemp, the weavers receiving only 15c. per day. This netting is stretched over a wooden frame, J, and is held in place by means of cross cords, K K. The affair is then placed at the last or lower end of the sluices at the point where the contents of the sluices run off to the river or ocean. As the water passes over the closely woven netting small particles of flour gold catch thereon. In the course of a few days the netting gets quite laden with the metal, which usually goes to waste. The netting is then removed and burned and the little gold obtained well repays for the work.

Some of the natives have a strange but fairly effective mode of catching some of the fine and worn gold particles at the beaches. Some of the samples I saw under the microscope showed indications of wear which must have been continued for years in the shifting sands of the uncertain beaches of the Philippines. I have seen horses go down and out of sight to their death in these quicksands. I once saw three United States soldiers go down simultaneously and escape by tumbling from their horses and rolling over and over to a place of safety, while the horses and equipment sank from view. In some of these sands the natives find rich deposits of very fine and worn particles of gold. They dig places in the earth near the beaches, like that in Fig. 6. There is an opening into which the gold-containing sands and waters are dumped and this leads to a domed cavity, C, the connection being by a channel, B. The idea of the dome is to protect the interest of the owner. Before he has done his day's work, he washes the gold-containing sands into the domed portion, where it is protected from thieves. Next morning the water has drained from the sands through the earth, and if signs of gold are seen, he scoops the sands into the inclined sluice in Fig. 7. This sluice is supported on posts, C C, and is long enough to suit the purpose. The sides are marked D, the sluice boxes E. Some of the natives use a sifting cradle, like that shown in Fig. 8, in which 2

*Abstract of paper read before the Institute of Mining Engineers, April, 1900.

posts, F F, are set up, as shown, and a pole is strung across. To this pole is suspended, by means of the hemp ropes I I, a wood box, H. This box is provided with a double bottom, K and L, and the upper bottom is fitted with a wire sieve. The sands to be sifted are placed in the inner box, J, which is also provided with a sieve bottom. To operate this device the natives work the box back and forth and the inner box is thereby shifted from end to end, and the contents are sifted through to the second bottom, L, whence they are removed as soon as there is an accumulation. This material contains the very finest of the sands, and in it is a percentage of fine gold which is well worth the labor of getting out.

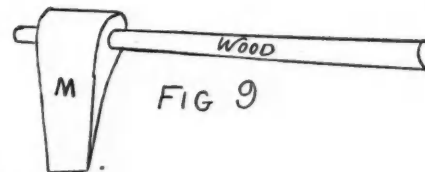
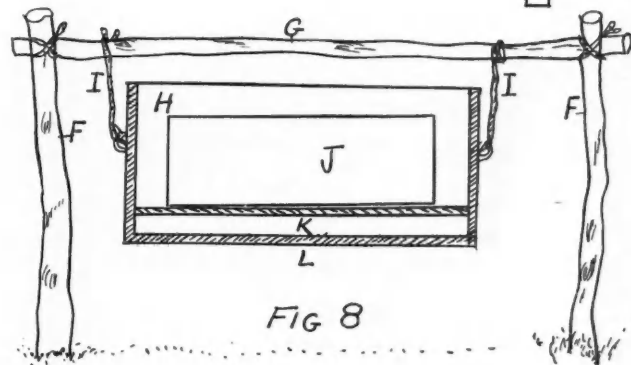
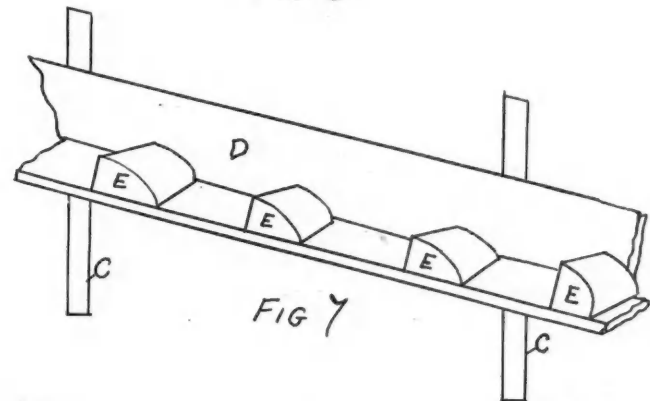
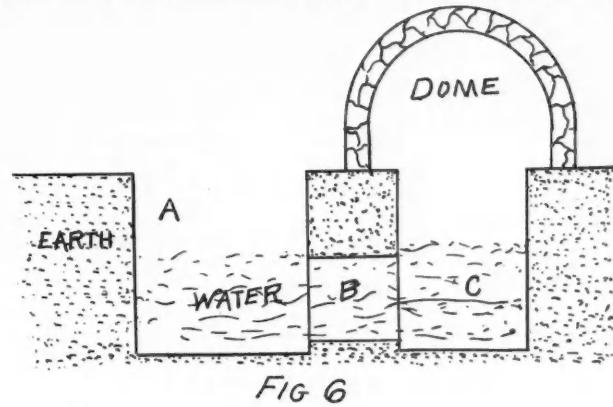
The native miners are furnished with very crude tools to work with, and in some of the mines I noticed that the only method they had for shoveling earth was by means of half shells of cocoanuts. In Fig. 9 is the form of tool they use for cutting and splitting wood, picking the earth, breaking rock and for general purposes. They make one tool answer several missions. I recollect seeing a carpenter using his chisel for both a chisel and a screw driver. Of course he had to resharpen



APPLICATIONS OF BORE-HOLES IN MINING.

Written for the Engineering and Mining Journal.

Probably no class of men are more severely taxed to devise economical ways and means than mining engineers in the anthracite coal region. If a canvas were made of the valuable devices and machinery now general throughout mining sections, it would probably be found that they originated, or were first adopted by the mining men of the anthracite field. Among the improvements that have been introduced during the last 20 years is that of using bore-holes to economize in material and labor. Originally bore-holes were introduced to obtain a water supply for towns and boilers, mine water being unfit for such service. Previous



NATIVE MINING DEVICES IN THE PHILIPPINES.

the tool whenever he had to use it as a chisel. It is the same with the miners. They will use one tool for a certain purpose for a time and then, owing to a shortage of tools, use it for another purpose.

SPITZBERGEN COAL.—Some further information has been received with regard to the existence of coal in Spitzbergen. An expedition of a private character dispatched from Norway last summer to the island to exploit the coal-fields, has returned to Trondhjem with good results. In Advent Bay large coal-fields were discovered and seized, and some brought home as a sample. The coals, which are said to resemble anthracite, are reported by experts to be of good quality. A company is in course of formation in Trondhjem in order to work these coal-fields. In addition, a cargo of coal has been brought from the well-known deposit at Cape Boheman, and has been tried on the State railways and otherwise. The drawback to these coals is, however, that they leave a very large quantity of porous slag in the furnaces, and are quite unsuitable for locomotives. The slag, or deposit, of scoria would also prevent the use of the coals for domestic and factory purposes.

to their introduction it was customary to haul water in dry times long distances, unless the collieries were favorably situated near some river or stream that did not go dry.

The water that was obtained from these wells driven into the coal strata was not all that could be desired, but was so much better than mine water that its use has continued. The analysis of artesian well water taken from Drifton No. 2 well is given as follows, the analysis being made in 1883: Chlorine, 0.0001; sulphur trioxide, 0.1395; silicic acid, 0.0380; ferric oxide, 9.9225; manganic oxide, 0.0181; aluminum oxide, 0.0380; ferric oxide, 0.225; manganic oxide, 0.0120; total solids, 0.2677; loss, 0.0022; total, 0.2699 gr. of soluble substances in every 1,000 gr. or liter of water.

The water, which was perfectly clear, gave a faint acid reaction; produced a decidedly milky reaction with barium chloride, and a very weak reaction with silver nitrate.

This water was treated before it entered the boilers, and even without previous treatment was decidedly better than mine water, as the latter, besides containing much calcium oxide, carried sulphuric acid suffi-

cient to destroy iron rails in a short time. The water supply for the Pocahontas Coal Field is almost entirely obtained from artesian wells.

The first hole bored for prospecting by the diamond drill is said to have been bored in the anthracite field of Pennsylvania.*

Many holes since then have been bored all over the world. The rope drill has also been extensively used for a similar purpose.

The Wyoming Valley is covered with an alluvial deposit, sometimes 300 ft. thick and more. The greatest depth of this deposit is between Nanticoke and Wilkes-Barre, on the Susquehanna River Flats. To guard against these alluvial deposits breaking into the coal mines, it is customary to put down bore-holes by the pipe system ahead of the workings so that a fair assurance of safety is continually maintained. These bore-hole tests are not always successful; in spite of the precaution taken a large body of quicksand broke into three of the mines of this district in 1899. This is due to the inability of the engineers to discover the exact outline of the outcrop of the coal beds in this valley, even with the numerous bore holes put down. A dangerous crevice may exist within a radius of a few feet from a bore-hole and not be discovered. However, the bore-hole is the only available test which is feasible, consequently mine owners spend large sums of money annually for them, and were it not for narrow pot-holes or crevices in the rocks which the drills fail to show there would be no accidents. As it is the expenditure amply pays for itself, by lessening accidents.†

Bore-Holes for Draining Gas.—At one time it was held that bore-holes in coal mines of gas. The theory was that explosive gas being lighter than air would find its way along the goaf to the bore-hole and so escape to the surface. It is scarcely possible, under ordinary mine conditions, for gas to rise up out of bore-holes connected with a goaf. If the goaf was hermetically sealed possibly sufficient gas pressure would be generated in time to force back the weight of the atmosphere, and allow the gas to escape through the bore-hole. With open goafs and exhaust fans, the inflammable gases, if any exist, gradually diffuse with the ventilating current passing along the edges of the goaf, and should a bore-hole be put down into such places, the air from the bore-hole would increase diffusion and carry more gas into the air ways. The Hill Farm fire was probably due to a bore-hole supplying air in this manner after an explosion of gas in that mine.

With blowing fans the reverse will occur, and every crack and crevice will be under pressure from the fan, and should they extend to the surface gas will escape from them, and not enter the ventilating current. The large goaves in the Oliver No. 1 and No. 2 mines, which are situated in Fayette County, Pa., could not be properly ventilated, and gas came into the current in such volumes as to make the return air dangerous.‡ A blowing fan was erected to clear this portion of the mine, but as it kept the gas back under greater pressure, it rather made matters worse instead of better.

To remedy this a 6-in. bore-hole was drilled over the goaf, and this drained the 12 acres worked out so completely that no gas has been encountered since in the airways connected with the goaves.

Bore-holes have proved useful for draining roof strata that contained gas, also coal beds themselves; but as a rule they have proved rather a source of danger than an effectual means of draining goaves of gas, until the blowing current was adopted.

Bore-holes are sometimes placed in the coal bed in order to relieve the gas pressure as the face advances. The States of Colorado, Illinois, Indiana, Pennsylvania and Washington require that in working toward or in close proximity to an abandoned part of a mine, that may contain fire damp or accumulations of water, bore-holes shall be kept ahead of the face and in some instances on both sides of the headings.**

Many disasters have occurred from neglecting to prove the ground ahead, and placing dependence upon old mine maps as a guide. The law does well in making provisions for bore-holes, as may be illustrated by the example at the National Mine, located on the Pan-Handle Railroad in Pennsylvania. An entry was driven to tap and drain off a large body of water from an adjoining mine. Drill holes were kept in the face and sides of the passageway at short distances apart, some of which were drilled in the coal over 20 ft. Finally the drill penetrated into the water in one of the side holes when bored a distance of 11 ft., the hole being in close proximity to one which had penetrated 16 ft. into the coal. The head of water was about 16 ft., and was reached 300 ft. sooner than the map indicated.††

Rope Haulage Bore-Holes.—The inconvenience of steam hoists underground has led to the adoption of wire rope haulage on engine planes. The motive power is placed at the surface and the rope carried down through bore-holes to the engine planes. The old method was to place the rope in the shaft and then by means of pulley wheels, rollers, etc., lead the rope to the engine plane. The inconvenience of the latter system, together with the repairs it required can be readily appreciated by miners. Endless rope haulage, where the power is transmitted from surface engines, by means of wire ropes passing through bore-holes, has also been adopted.

As an illustration to what extent power may be transmitted in this manner, the rope haulage plant at the Indian Ridge Colliery is cited.‡‡ The colliery is situated in Schuylkill County, Pa., and the haulage system extends from the bottom of the shaft to the old Buck Mountain slope, a distance of over 2,000 ft. Two bore-holes were sunk from the surface, through which the ropes pass from the drum, attached to a pair of engines; length of rope 2,800 ft.

Culm Flushing.—The waste coal from machines is somewhat of a nuisance as it must be caught in settling dams and then removed. It is now frequently run into mines to fill up worked-out portions, thus acting as an artificial pillar and allowing, in some instances, coal pillars to be extracted safely. The culm is deposited in the mine through bore-holes which run from the surface. One peculiar case of culm flushing is

noted at Sugarloaf and Stockton collieries, near Hazleton, Pa. There is an opening between these two collieries which is partly blocked by falls and caves, and which allows a certain percentage of water to percolate into the Stockton mines. A bore-hole has been drilled into a section with which this opening communicates, and breaker wash-water will be turned into it to fill the section with coal dirt. It is expected that this will effectually stop any influx of water from the East Sugarloaf workings.

In another instance culm flushing was employed to make a dam to seal up a mine fire.* This was accomplished in two or three days. There are conditions where a passage can be closed by flushing with culm, and such conditions existed at Maxwell No. 20 Mine fire near Wilkes-Barre, Pa. This method has the disadvantage of being slow, and to reduce a current of air gradually in a gaseous mine having a fire burning is apt to create a large body of explosive gases and to produce explosions. The reduced air current allows gas to accumulate, and at the same time supplies the air necessary to make it highly explosive. Another disadvantage is the expense of removing the culm which has spread over a long distance, after the fire is out. When a mine or part of a mine is sealed by flushing, the time of greatest danger is when it is being reopened. By making arrangements to cut the air off at the commencement of flushing the chances for explosions are minimized.

Bore-Holes for Air Conveyance.—The transmission of power by compressed air is gaining headway in coal mines. Besides being employed for haulage, and cutting and drilling coal, it is also employed for hoisting and pumping. Under such conditions it is but natural that to economize in the use of air pipes, bore-holes should be driven to shorten pipe lines.

At Baltimore Colliery No. 2, in Luzerne County, Pa., air is conveyed down a bore-hole 630 ft. deep to run 10 by 12-in. engines on a plane. At Jeddo, Luzerne County, Pa., air is carried to an artesian well 3,600 ft. away from the compressors to a pneumatic pumping system employed to raise water from the artesian well.

Steam Conveyance.—Where engines and pumps are employed underground the steam is generated at the surface and conveyed to the motors by steam pipes which are often let down through bore-holes in order to save power. In two instances the exhaust steam from the pump is carried to the surface through the bore-hole which contains the steam pipe.†

Bore-Holes as Column Pipes.—In 1884 an 18-in. diameter bore-hole was put down about 250 ft. at Drifton No. 1 Colliery, Pa., to serve as a column pipe. The interesting features in connection with this bore-hole were that it probably was the largest hole drilled with a solid bit up to that time; and that when the bit reached within 6 ft. of the excavation it knocked out a large piece of rock which necessitated the construction of a casting to make connections between the pump and the bore-hole. In case there are crevices in the strata through which the bore-hole passes, they must be closed in some manner, usually by casing and cementing or cementing alone. At Plymouth No. 2 Colliery in Luzerne County, Pa., there is a 20-in. diameter bore-hole to be used as a column pipe. This is 600 ft. deep and was drilled with a solid bit by the American rope drilling system. The cost of drilling this hole was a fraction more than \$7 per foot. It is the intention to use this hole as a column pipe without casing.‡ At Olyphant Mine in Lackawanna County, Pa., two pumps deliver water to the surface through an 18-in. diameter bore-hole,‡ and at Jermyn No. 1 Colliery in the same county three pumps deliver water to the surface through a 16-in. diameter bore-hole.** At the Leith Mine in Fayette County, Pa., a 14-in. diameter bore-hole is being drilled to answer as column pipe.††

General Considerations.—The flexibility of the application of bore-holes to mining purposes is further shown, when one considers that salt mining is carried on by pouring fresh water down one bore-hole into a salt bed and pumping up the salt water through another bore-hole. An attempt was made in Louisiana to mine sulphur through bore-holes, but the plan did not meet with success owing to the sulphur cooling before it reached the surface.

SURVIVAL OF TOADS IN ROCK.—Some experiments were lately made in England by Rev. W. Buckland, to test the truth of the commonly accepted belief that toads can survive for long periods in crevices of rocks, etc., without air. He first secured a large block of coarse oolitic limestone and prepared 12 circular cells in it, each about 1 ft. deep and 5 in. in diameter, and having a groove or shoulder at its upper margin so fixed as to receive a circular plate of glass and a circular piece of slate to protect the glass; the margin of this double cover was shut up tightly, so as to render it perfectly impenetrable to air and water. He then prepared 12 smaller cells, each 6 in. in depth by 5 in. in diameter, in a large block of silicious sandstone, these cells also being covered with glass and slate and luted around with soft clay. The object of the glass covers was to allow the toads to be seen without having to remove the lids and thus let in air and insects. The limestone was porous, and was not impervious to water, and probably allowed air to get in also. The sandstone, however, was very compact. One live toad was then placed in each cell; the covers were placed on and cemented down. The weight of each toad was carefully ascertained. The large and small toads were distributed equally between the limestone and the sandstone cells. Both stones were then buried under 3 ft. of earth. After 13 months had elapsed the professor exhumed the toads and found that every one of them in the sandstone cells was dead. Their bodies were considerably decomposed, showing that they must have been dead for months. A majority of the larger toads in the block of limestone were alive, but in every instance the glass covers were cracked. The toads were weighed, and it was found that they had decreased in weight. The conclusions at which the professor arrived were that toads cannot live a year totally excluded from atmospheric air and that they cannot live two years when they are totally deprived of food.

*American Well Works, "Encyclopedia."

†Report Bureau Mines, Pennsylvania, 1899, p. 182.

‡Report Bureau of Mines, Pennsylvania, 1899, p. 645.

**"Mining Accidents and Their Prevention," pp. 244, 247, 258, 330. Scientific Publishing Company, New York.

††Report Bureau Mines, Pennsylvania, 1899, page 776.

‡‡Report Bureau of Mines, Pennsylvania, 1899, page 312.

*Report Bureau Mines, Pennsylvania, 1899, page 179.

†Report Bureau of Mines, Pennsylvania, 1899, pages 633, 636.

‡Bureau Mines, Pennsylvania, 1899, page 5.

**G. M. Williams, Mine Inspector.

††Report Pennsylvania Bureau Mines, 1899, page 633.

THE AMERICAN STEAM STAMP.

The American Engineering Works of Chicago have just placed on the market a new steam stamp mill which is shown in the accompanying illustration. This new design has been in use for only a short time, but experiments already made have shown that the mill is capable of very satisfactory work. The principal features that distinguish this mill from others are the provisions for controlling the number of strokes per minute and the force of the blow, and for the proper adjustment to compensate for the constant wear of the shoes and dies. The valve motion is obtained by upper and lower tappets which are keyed to a vertical rod. The lower tappet is movable on a feather which takes the place of the key. The position of this is controlled by a hand lever with binding screw. When the lower tappet is in its lower position, the full stroke and hardest blow is obtained. By raising this tappet the stroke can be shortened or the blow regulated to any extent desired. This is an important detail, as it permits this stamp to be operated with a very heavy, full blow—say 1,800 or 2,000 lbs.—or with the lightest blow which could be obtained from a small gravity stamp. This great range in force of blows is a particularly valuable feature where the mill is to be used in experimenting on ores, the best methods for treating which are not thoroughly understood.

The throttle valve is connected by an universal joint and rod to a small hand wheel located at one side of the machine in a convenient

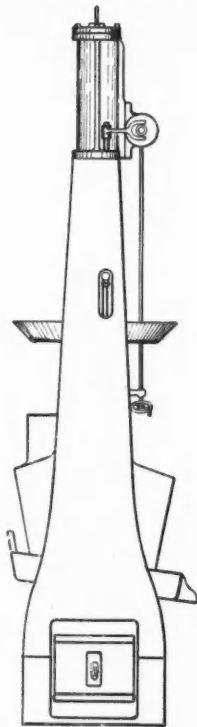


FIG. 2.

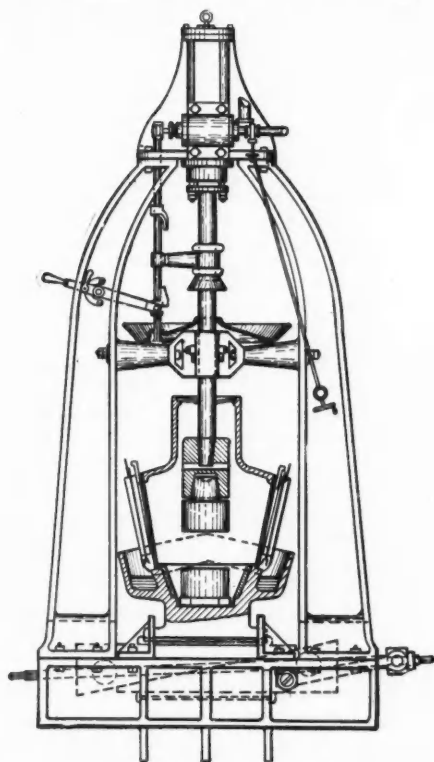


FIG. 1.

THE AMERICAN STEAM STAMP.

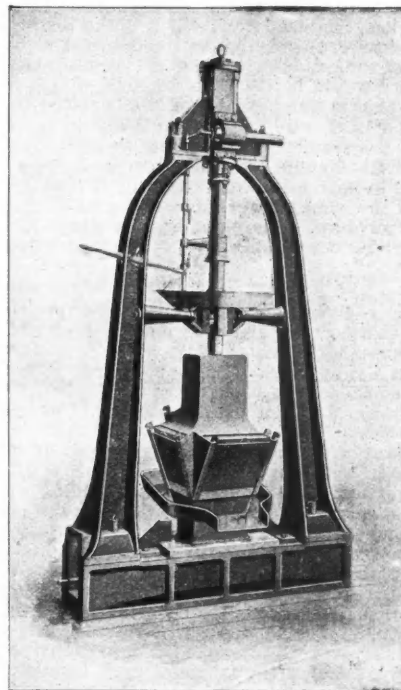


FIG. 3.

position so that the operator can very easily change the supply of steam at any moment, regulating the number of strokes per minute. There is no possibility of any grease, oil or greasy water from the steam cylinders falling into the mortar, for about the center of the machine, as shown, is a large sheet steel tray, which acts as a thorough protector.

Fig. 1 shows the mortar, steam-head, shoes and dies, all in section. It will be noticed that the shoe and die are of the regular form used in all gravity mills. This is not a very important feature, but at the same time it is an item in favor of this mill, as shoes and dies of special shape are not required. The mortar has discharge openings on all four sides, which insure the fullest capacity. The capacity of this mill is from 8 to 24 tons per day, depending upon the nature of the ore and mesh of screens. Fig. 2 is a side elevation, while Fig. 3 is from a photograph of a mill.

A prominent feature in connection with this steam stamp is the provision for raising the mortar so as to compensate for the wear of the shoe and die. The mortar is supported by two heavy cast-steel wedges, which in turn rest on a heavy cast-steel base. These wedges are connected by swiveling nuts to a 2 $\frac{3}{4}$ -in. steel screw and are so arranged that they always maintain the same relative position to the center line. In all stamps as the faces of the shoes and dies wear away, the force of the blow changes. In this stamp this wear can be taken up as frequently as desired by a slight turn of the large screw connecting the wedges. These wedges sliding on each other give the mortar a perfectly straight vertical movement. Thus this mill has the great advantage of changing the position of the mortar while in operation. The whole machine is self-contained and requires an inexpensive foundation.

A NEW MINERAL RAILROAD IN POLAND.—A new railroad on which work has just begun in Russian Poland will connect Schidlovetz with Prjissoukha with branches to Yanov and Kouznitsa, the total length being about 36 versts. Schidlovetz is well known on account of its quarries, its deposits of iron ore and its rich forests, but the lack of proper means of communication has hitherto hindered the exploitation of its natural wealth.

THE EMERALD MINES OF CLEOPATRA, IN EGYPT.

A journey of exploration to what are known as the emerald mines of Cleopatra is described by D. A. MacAlister in the latest number of the "Geographical Journal." They lie in the mountain range that extends for a long distance parallel to the Red Sea, and a few leagues west of its coasts, in a latitude rather south of Eofu, on the Nile. This, like some other parts of the region, such as the porphyry quarries of Jebel Dokhan, was far better known than it is now, and more thickly peopled, about 20 centuries ago, and only during the present one, so far as we know, have isolated explorers, at long intervals found their way into the treasure house of ancient Egypt. When its rulers first used the emerald for personal adornment is uncertain. Whether the large, clear green stones which, according to ancient authorities, ornamented the Egyptian temples, were really emeralds is a matter of dispute, but as this gem—owing to its regular shape, which is commonly a six-sided prism, and its beautiful tint—stands less in need of the lapidary's art than many others, it probably formed part of the regalia of princes at a very early period. That it was known to the Romans is certain, and the mines now revisited used to send their treasures to the gem cutters of the capital. Ever since then the stone has been highly esteemed. In the Middle Ages few jewels commanded a higher price, for, in addition to its beauty, fancy endowed it with medicinal virtues. It was a prophylactic against epilepsy and a cure for dysentery. Like the sapphire,

it guarded the chastity of the wearer, and resented any trespass by breaking into pieces. Though a more prosaic age has divested it of these virtues, it is still highly valued, nor do we condemn its less brilliantly colored relative, the aquamarine, or beryl, which is practically the same mineral, the tint of the emerald being due to the presence of a small quantity of the metal chromium.

These mines of the Northern Etabi seem to have remained untouched since the decline and fall of Rome caused them to be deserted. According to Mr. MacAlister, the workings are only small passages, hardly more than burrows, excavated in the emerald-bearing schist, and sometimes extending for a long distance. Many scattered ruins may also be seen—dwellings, watch towers and tombs, besides those of ten settlements. In these, no doubt, the mining population used to live, and the differences in style suggest they were occupied for a long time. Some are mere hovels, very roughly built; others show a more careful construction; while a third group are well finished. Mr. MacAlister also found three rock-cut temples, for the soft stone lends itself to that kind of architecture. He thinks that their pillars, though very primitive in style, indicate Egyptian designs, with traces of Greek influence; one, indeed, contains a crumbling inscription in that language. Broken pottery, sometimes ornamented, is abundant, but there is no evidence that the neighborhood attracted visitors for any but business-purposes.

Notwithstanding this, there was in those times a settled instead of a nomad population, and travelers once must have been rather frequent, for in one place many drawings of persons, animals and tribal marks are scratched upon the rocks. The subjects are various enough; family scenes and fights—in which the weapons are swords and spears, bows and arrows—camels and dromedaries, horses, dogs, goats and oxen, beside ibex, gazelles and ostriches. Some of the figures evidently are much older than others; but, as a whole, they recall to memory the Sinaitic inscriptions which some 40 years ago were believed to be memorials of the wanderings of the Israelites. To this attractive hypothesis the late Professor E. H. Palmer gave the death blow, which he demonstrated them to be—as, no doubt, are these of the emerald mines—only the "graffiti" of travelers, none of them, probably, earlier than the Christian era.

ABSTRACTS OF OFFICIAL REPORTS.

New Guadalcazar Quicksilver Mines, Limited, Mexico.

The report of this company covers the year ending August 31st, 1900. The total receipts from sales of quicksilver, etc., as reported from the London office, were £5,305. Expenses at mines, etc., were £3,036; general expenses, depreciation, etc., £896; total, £3,932, leaving a balance of £1,373 for the year.

The directors' report says that whereas the working of the mines for 1898 resulted in a loss of £925, and for 1899 in a loss of £1,028, the accounts for the year under review show a profit of £1,373, which had been applied in reduction of the debit balance of £1,890, brought forward from last account, and which now stands at £517. This profit is arrived at after writing off £92, the balance of the preliminary expenses connected with the formation of the company, and also the sum of £178 for depreciation of machinery, tools, furniture and tramway. During the year there has been no recurrence of the labor troubles referred to in the last report, and except for the interruptions which must always occur owing to the numerous holidays (fiestas), work has been carried on in its normal manner. The extraction of ore has amounted to 1,784 tons of 2,000 lbs. Spanish, as against 1,141 tons in the previous 12 months—an increase of 643 tons, or 56 per cent.—and the assay value has risen from 1.15 per cent. to 1.33 per cent. No large bodies of ore have been met with, but the indications continue to be, on the whole, satisfactory, although the improvement which took place in the output of ore during the second three months of the year has not been fully maintained. The total quantity of ore treated by the furnaces has been 1,524 tons of 2,000 lbs., Spanish, from which 33,600 lbs. = 448 flasks of quicksilver, were recovered, showing a percentage of recovery of 80.06, but if the contents of the residue from the last burning be added, this percentage of recovery would be increased to 83.07, which is a very slight falling off from the previous year, when it was 83.47. Owing to the scarcity and dearthness of fuel, no burning took place in the months of July and August, with the result that the quantity of ore on hand accumulated considerably. Good supplies of fuel have now come in, and the furnace was re-lighted in September. A further drift is being cut to improve the ventilation of the existing workings, and also to provide for ventilation as the works advance. The plant and buildings have been maintained in proper working condition.

Pahang Corporation, Limited.

This company owns several extensive tin properties in the Malay Peninsula. Its report for the year ending June 30th, 1900, shows that during the year 37,220 tons of stone were crushed, producing 808 tons of black tin of a value of £74,382, as compared with 30,346 tons of stone, which produced 858 tons of black tin of a value of £59,760 in the previous year. The average assay of the stone was 2.17 per cent., against 2.8 per cent. in 1898-99.

The operations of the year resulted in a profit of £27,322, as compared with £23,861 in the previous year. The price of tin has been high throughout the year, and though not maintaining the figure at which it stood at the date of the last report, the average price at the dates of sale of the company's produce was about £134, against £98 per ton in the preceding year. In these circumstances, it is unfortunate that it has not been possible to reap the full advantage of the prices now ruling, owing to labor troubles, which have been more acutely felt during the past year than perhaps ever before. Even the labor procurable proved to be of inferior quality, and, as a result, the costs of working show a decided increase over last year in every department except milling, where the further labor-saving machinery installed has resulted in a slight decrease of cost per ton. As in the past year, the whole cost of the shaft sinking (£4,298), and development of the mines (£6,504), has been charged against the year's revenue, and £1,206 has also been debited, representing the cost of the maintenance of and repairs to machinery. In addition to this, the sum of £1,559 has been written off for depreciation of plant, etc. After these deductions and after reserving a sum of £488 in respect of income tax on the dividend declared last year, the net profit on the year's operations amounts to £25,274. This sum, added to the amount brought forward (£20,716), (less £4,000 placed to reserve last year, and the sum of £14,659, the amount of the dividend paid in November, 1899), leaves a total of £27,331 to the credit of the revenue account. Out of this, the 10 per cent. dividend on the preference share to June 30th, 1900, has been paid, absorbing £4,431. A sum of £22,901 remains, out of which the directors recommend a dividend of 6 per cent. free of income tax, on the 244,306 ordinary and preference shares. This, including the tax, will absorb a sum of £15,391, and a sum of £7,510 remains, £6,000 of which the board propose to place to reserve, making £18,605 to the credit of that account, and carry forward the balance of £1,509.

The net profit for the year amounted to £3,525 in excess of that earned in the previous year. In ordinary circumstances a larger dividend might have been recommended, but very considerable additions in machinery have been found necessary, involving a heavy outlay, a large part of which will fall upon the current financial year. Development work on the company's various properties was steadily carried out.

In addition to the tin a small shipment of copper ore from Nicholson's Lode, amounting to some 13 tons, was sold. This ore contained 18½ per cent. of copper and 17 oz. of silver per ton.

At the Jeram Lumpung Mill only 35 stamps were running during the first six months, since when the full 40 have been fairly continuously at work. Considerable extensions have been made at this mill during the year, and more powerful engines have been erected in addition to other alterations and improvements. The erection of some larger roasting furnaces, which work is not yet completed, resulted in the accumulation of a large amount of concentrates during April, May and June. These, which were estimated to contain 46 tons of black tin, are still awaiting treatment. An order has been given for an additional 20 stamps, which will be erected alongside the existing 40 at Jeram Lumpung. These will be erected partly with a view to treat ores from the property of the Pahang Kabang on terms which will leave a profit to this company, and

partly in preparation for an increased output from the mines of the corporation.

The scheme for running the works by electricity is still under consideration, and further particulars as to the power required, and its probable cost, are being collected. In the meantime a plentiful supply of fuel is at hand for a long time to come.

HANDLING LIQUID FUEL ON A RUSSIAN RAILROAD.

According to the "Petroleum Review," the oil used for fuel on the Moscow-Kazan Railroad is kept in iron reservoirs, or in basins dug in the ground, called "naphtha graves," having a capacity of from 1,000 to 3,000 tons and the supply of naphtha for the Moscow-Kazan Railway is obtained during the period when navigation is possible on the Volga from Baku and is brought to the landing stages of Swiajsk and Novgorod. At Swiajsk the oil is pumped from barges into the reservoirs of the depot, from which place it is transported in tank cars to the supply stations on the line Riazan-Kazan, while during the period when the rivers are accessible (May to October), the barges carrying oil ascend the River Oka as far as Riazan, where the principal depot for supplying the feeding stations on the Moscow-Riazan line is situated. These routes were selected from economical considerations.

The average consumption of oil during the winter is estimated at 13.25 kg. per kilometer of line, and on this basis the quantity necessary to keep in stock on the various points of the line has been determined, and also the quantity required for fuel purposes in the repair shops, etc.

The composition of a feeding-station for the supply of oil to the engines comprises one or more iron reservoirs sunk in the ground, an installation for pumping up the oil, and a tank from which it is delivered to the locomotives.

The pumping works consist of a steam pump, usually of the Worthington type, a boiler and a water tank for the feeding of the boiler. The oil, which is brought up in tank wagons, is driven into the reserve or distributing reservoirs and cars are filled at the same time by means of a system of pipes.

The pipes which connect the different parts of the installation have a diameter of 125 to 205 mm., according to the size of the station.

The consumption of oil for firing the locomotives during the year 1898 was 66,820 tons, and in 1899, 78,500 tons; for fuel purposes at the shops for obtaining water and for the naphtha supply stations in 1898, 4,165 tons, and in 1899, 4,500 tons.

CANNON BALLS IN QUARRYING.—The United States Government recently sold a large quantity of old cast-iron cannon balls, which had been stored in the Charlestown Navy Yard, to a Boston dealer, who has found a market for them among the Cape Ann and Quincy quarrymen. The first use they were put to was in place of steel wedges in splitting off large blocks of granite. The method pursued with the cannon balls is to start the block of stone away by a slight blast, and then between the quarry face and the block several of the smaller solid shot, usually the 4-in. sort, are dropped down into the aperture. Two men with crow-bars give the block a little shake, and the instant the block moves in the slightest manner forward the shot take up their purchase on the space made, when the large cannon balls, some measuring 12 or 15 in. and weighing 200 or 300 lbs., are dropped into the top of the gap. Now the slightest outward jar by the levers on the big stone sends these heavy cannon balls dropping downward of their own weight, until, with an easy forward movement, the cube goes over on its face. These shot do away with any driving; of necessity their great weight in proportion to their size forces them downward, and their form prevents any chance of backward setting of the block.

The cannon balls are also used as rollers, as they take up and go over the inequalities of the quarry surface and can be rolled in any direction without resisting, thus doing away with the old-style wooden rollers. They are also used to smother heavy clearing out blasts. Heavy rope mats are thrown over the surface where the blast has been set and these cannon balls are thrown on the mats.

IRON-MAKING IN SOUTH CAROLINA.—Mr. James M. Swank says, in the "Bulletin" of the American Iron and Steel Association: "In the northwestern part of South Carolina, including the counties of Union, Spartanburg, Cherokee, and York, are valuable deposits of magnetic ore, and here the first iron works in the State were erected by Mr. Buffington in 1773, but they were destroyed by the Tories during the Revolution. Soon after the Revolution both furnaces and forges were built in York County, and about 1815 there was a sheet mill in this county; also a nail factory. In 1802 an air furnace was erected on a neck of land between Cooper and Ashley rivers, where good castings are said to have been made. Tench Coxe enumerates two bloomeries in Spartanburg County in 1810, four in Pendleton County, two in Greenville County, and one in York County—nine in all. He also mentions one small nailery and one small steel furnace in the State. He makes no reference to blast furnaces. In the census year 1840 there were four blast furnaces in South Carolina and nine bloomeries, forges and rolling mills. In 1856 South Carolina had eight furnaces—one in York, one in Union, and six in Spartanburg County. They are described by Lesley. Four of these furnaces were then in operation, but the other four had been virtually abandoned. In 1856 there were also three rolling mills in the State—one in York, one in Union, and one in Spartanburg County, all of which were active in that year.

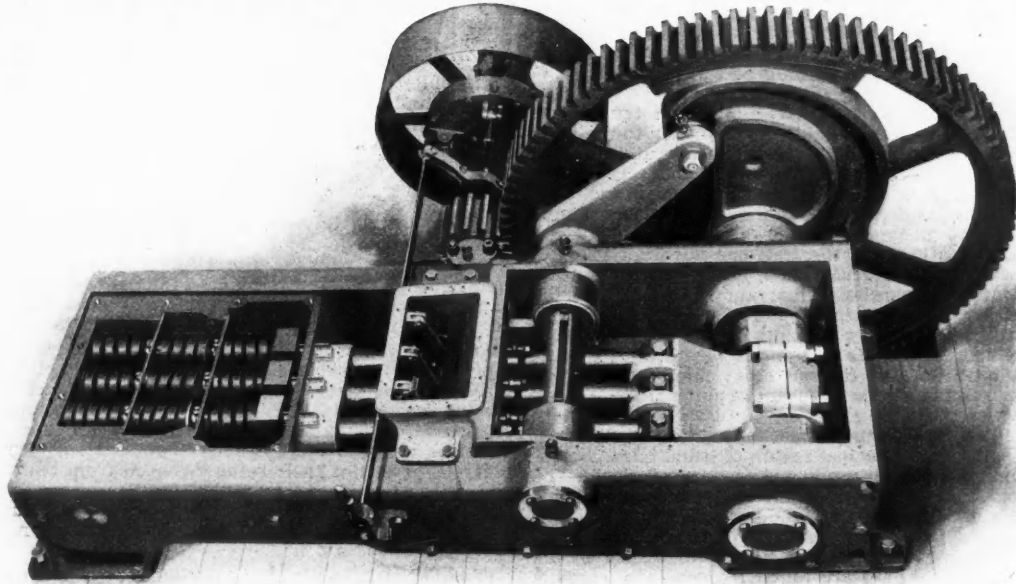
"Owing to the entire absence of mineral fuel it is perhaps too much to hope that South Carolina will soon see a revival of the manufacture of iron within its borders, but it is not at all improbable that in the near future its valuable deposits of iron ore will be mined and shipped on a large scale. Better railroad facilities than now exist would hasten this end. . . . Colonel J. C. Black, of Blacksburg, Cherokee County has furnished during the past year or two considerable quantities of magnetic ore to the Cherokee Furnace of the Empire Steel and Iron Company, at Greensboro, North Carolina."

THE PROGRESS OF BRIQUETTING IN AMERICA.

The plan of briquetting fine metal-bearing ores was taken up by Mr. Henry S. Mould, of Pittsburg, early in 1895. At that time Mr. Mould was interested in a deposit of bog manganese ore or wad that needed drying and compressing into block form in order to make it marketable, and knowing the great waste in blast furnace practice in the way of flue dust, from the introduction and use of fine Mesabi ores,

pairs, and it was also deficient in other particulars. The pressure was insufficient, and for other reasons many materials desirable to briquette could not be operated upon.

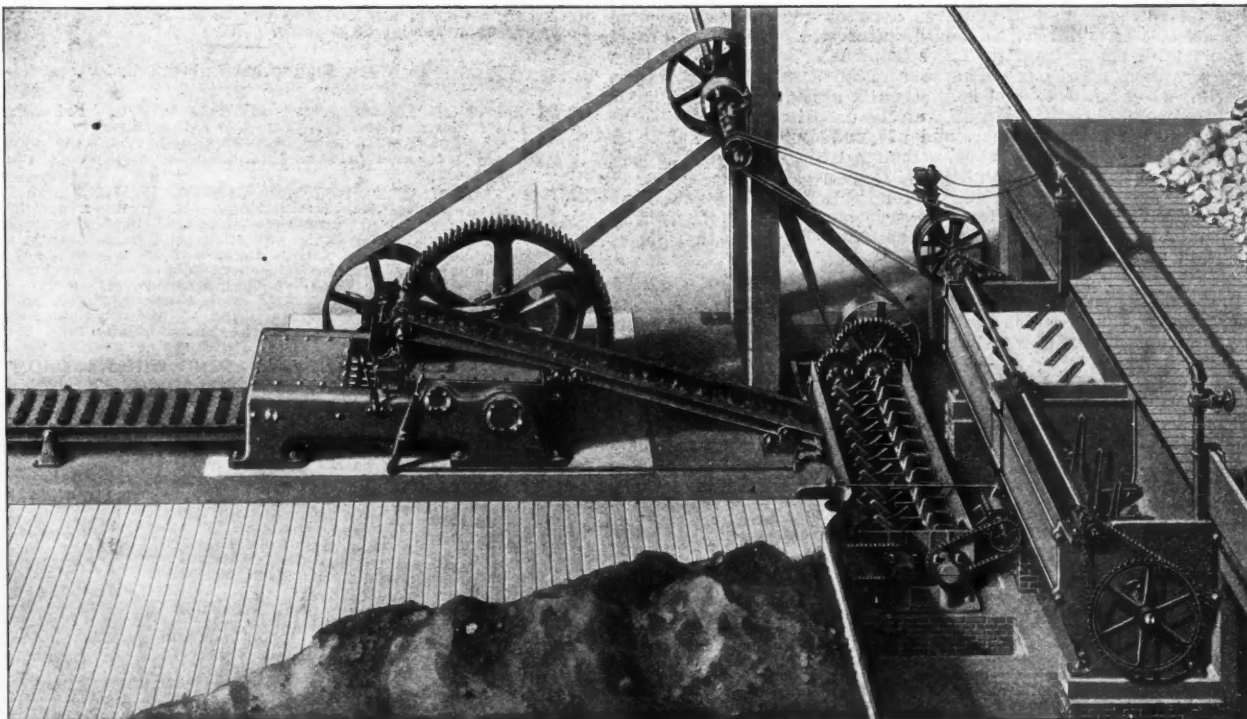
In 1898 the Henry S. Mould Company was incorporated and as sole licensee and manufacturer controls Mr. B. C. White's patents and inventions in the line of briquetting. From the practical experience gained and from further study, both in this country and abroad, of the necessities of a press in the enlarged field of briquetting, Mr. White invented, designed and patented the White briquetting press. The first



No. 2 WHITE BRIQUETTING PRESS.

commenced a series of experiments in the briquetting of these materials. These experiments, made on hand and hydraulic presses, were for the purpose of determining the kind of binder necessary for the purpose and the amount of pressure required. In conjunction with the Illinois Steel Company and in order to get a furnace test of flue dust briquettes, 1,500 tons of flue dust was briquetted, using an "egg-ette" roll press. While this process could not be made a commercial success, it proved the desirability of the briquettes in the furnace. At

plant equipped with the White briquetting press and apparatus was erected in Pueblo, Colo., in August, 1899. The defects of the press were developed when it was put into practical use. They were slight, however, and easily remedied, as is shown by the fact that this plant has been in continuous operation from its installation to the present time, and without repairs or replacements being furnished by the manufacturers. After the experience at the Pueblo plant the press was redesigned in some points, and from time to time improvements have



WHITE BRIQUETTING PRESS AND OUTFIT.

this time the subject was brought to the attention of Mr. B. C. White, who had had considerable experience in designing brick presses, and who also knew the needs of smelters in compressing their flue dust, roasted ores, etc., and their use of brick presses for this purpose. The efforts to briquette fine materials on a commercial scale with brick presses and presses designed for some other purpose were not a success and after careful study of the subject a machine known as the White mineral press was invented, designed and patented by Mr. White in 1896. This machine was a step in the right direction, and for a time, in the absence of anything better, filled a want felt by smelters; but it was found to be too expensive in production and re-

been made, the object being to make it the best briquetting press obtainable.

During the year 1900 a number of plants equipped with the White briquetting press and apparatus have been erected in this and foreign countries, all of which are giving satisfaction. The field of briquetting is not confined to the needs of smelters; fine ores, flue dust, magnetic concentrates, iron sands and manganese ores are briquetted for blast furnace use, and in the briquetting of coal and coke dust the industry will hereafter assume large proportions in this country.

The illustrations herewith show a White briquetting press separately, and a press with full outfit for work.

MINERAL COLLECTORS' AND PROSPECTORS' COLUMN.

(We shall be pleased to receive specimens of ores and minerals, and to describe and classify them, as far as possible. We shall be pleased to receive descriptions of minerals and correspondence relating to them. Photographs of unusual specimens, crystals, nuggets and the like, will be reproduced whenever possible. Specimens should be of moderate size and should be sent prepaid. We cannot undertake to return them. If analyses are wanted we will turn specimens over to a competent assayer, should our correspondent instruct us to do so and send the necessary money.—Editor E. & M. J.)

251.—Tourmalines from Connecticut.—At a recent meeting of the New York Mineralogical Club Mr. D. S. Marten described the tourmaline mine at Haddam Neck, Conn. The quarry is an open cut 50 ft. wide and about 100 ft. long, in a large outcrop of white feldspar, this being the principal mineral of a great pegmatite vein or dike that cuts through the gray mica-schist country rock. The quartz of the pegmatite is gray, often smoky, and at times highly ferruginous; the mica is a greenish muscovite, and the feldspar is the soda variety, albite. Black tourmaline and almandine garnet are abundant throughout. The albite is purer in the central portion of the vein, and the quartz and mica more prevalent near the gneiss. The vein, which strikes nearly north and south, has been worked to the gneiss wall on the western side, where the contact is well defined; to the east the wall has not been reached. About midway of the excavation a great horse of the gneiss appears to divide the feldspar into two parallel veins; but these unite to the south. A few rods further south another outcrop of very pure feldspar has been opened a little; this may be another vein, or more probably an extension of the main one. The rare and beautiful colored tourmalines which have made this locality famous, occur chiefly in the marginal portion of the vein, or dike, rather than in the purer albite. Along the contact zone of the west wall the mica prevails largely for a thickness of perhaps 2 ft. Here, and in the mixed material lying between this and the purer feldspar, is the principal region of lithia mica, lepidolite and the lithia tourmalines, green, pink and variously tinted. The lepidolite does not occur in large masses of small crystals, as at similar localities at Paris, Me., and in San Diego County, Cal., but in larger crystals, and very often as a border around crystals of muscovite, perfectly continuous, but sharply defined, and easily distinguished by its lilac or roseate tint. The tourmalines are found frequently in crystals of smoky quartz, traversing them completely, and also in the mica, thus showing that both these minerals were formed around them, apparently a little later than the tourmalines, but all in the same general stage of the cooling and crystallizing process. The finest tourmalines are found in cavities or pockets, often lined with crystals of albite and ferruginous or smoky quartz, in which the tourmalines have had room to develop in large and perfect crystals.

253.—Minerals from Alabama.—J. T.—No. 1 may be called a saprolite; it is a much decayed rock, almost a clay. It may have been a mica-schist. No. 2 is not emery at all, but is actinolite, a variety of hornblende. Emery is very much harder. No. 3 is, as you say, kyanite, an aluminum silicate. No. 4 is an impure hematite, an iron ore. There is nothing about the specimen to show whether or not such rock would turn to pyrites, iron sulphide, in depth. It might. The dark-brown crystal you send is smoky quartz. The specimens of white and red rock are chert, a variety of quartz. They are of no economic importance. The large imperfect white crystal is apparently albite feldspar. A good graphite mine would pay in Alabama, but the deposit would have to be of some size, not a mere stringer, and of good quality. Graphite is quoted at but \$30 per ton, New York, although little high grade is produced in this country, because high-grade Ceylon graphite can be had at that price. There is almost no market for rutile, except for handsome crystallized specimens for collectors. A very small amount is used in making false teeth. We have received no specimen from you that shows any indication of containing free gold.

254.—Graphite.—Orchard Grove.—The sample of graphite you send is of poor quality. The rock is really a graphitic schist and contains too many injurious impurities to have any market value.

255.—Gold Ores.—J. K.—No. 1 is a bluish quartz, carrying iron pyrites, and possibly some free gold. It should be assayed. No. 2 is oxidized vein material; it may carry gold, but is not promising. No. 3 is a complex sulphide ore, probably tetrahedrite. It carries considerable antimony, also copper and silver. It may carry gold. No. 4 is a pretty specimen, showing free gold and argentite, sulphide of silver, in calcite.

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.—Editor E. & M. J.)

The Dominion Mining and Chemical Company.—Have you any facts in relation to this company and its operations?—R. E.

Answer.—In reply to this inquiry, we have made investigations, and we believe the following to be about the facts in the case. The Dominion Mining and Chemical Company owns about 400 acres of farming land in the vicinity of Mineral City, Virginia. Similar land in this neighborhood is worth from \$5 to \$7 an acre, and as this property has not found any paying deposits of pyrites or other minerals, it probably can be counted at about that price. In fact, we believe that the Dominion Mining and Chemical Company paid about \$10 an acre or it, and this was considered a high price. There is no mineral deposit known in the property which justifies an issue of bonds at any price; or, in fact,

which would indicate a value above the \$10 an acre which the company is supposed to have paid for it.

Antimony Ore.—Can you inform me what is the current price of antimony ore? What is the lowest grade of ore, or percentage of metal accepted by buyers?—Antimony.

Answer.—Quotations of antimony ore cannot be obtained from buyers, who say that it is impossible to give any current price, as the ores vary so much in the impurities which they contain. Of two ores carrying the same percentage of metal one may be valuable and the other almost worthless, owing to association with arsenic or other impurities. Buying, therefore, is based entirely on assay. An ore containing 50 per cent. white oxide would be readily accepted, if good in other respects. The demand for ores is good at present.

The antimony business is comparatively a small one, and is controlled by a few smelters. Thus in the United States there are only two buyers, Mathison & Company, of New York, and the Chapman Smelting Works Company, of San Francisco.

Concentrating Silver-Lead Ores.—In your issue of November 3d, page 524, I note an inquiry from "W. P. K." regarding concentration of silver-lead ores. I have a precisely similar case, viz., tetrahedrite in a gangue of barytes, and recognized the impossibility of wet concentration. Can you suggest through your columns a method for recovering both copper and silver values in such a case?—L. P. C.

Answer.—In further answer to the above question, which appeared in this column December 8th, page 673, the Wetherill Separating Company of No. 52 Broadway, New York, writes us as follows: "In reference to the inquiry from L. P. C. in your issue of December 8th, respecting the separation of tetrahedrite from barytes, we beg to say that certain varieties of tetrahedrite (Fahlerz) possess sufficient magnetic attractability to permit of their being removed from barytes, galena and other non-magnetic minerals by the Wetherill process of magnetic separation. If your correspondent 'L. P. C.' will mail us a sample of about 2 lbs. of his ore we shall take pleasure in testing it for him."

ITALIAN DEMAND FOR COAL TAR.—The Bureau of Foreign Commerce at Washington has received a letter from Mr. J. P. Spanier, 160 Corso Umberto I^o, Rome, dated November 6th, 1900, asking to be put in communication with some responsible firms in the United States who can offer full cargoes of pitch extracted from coal, to be used in the manufacturing of patent fuel. Considerable business, he says, can be transacted if connections are made with the proper party.

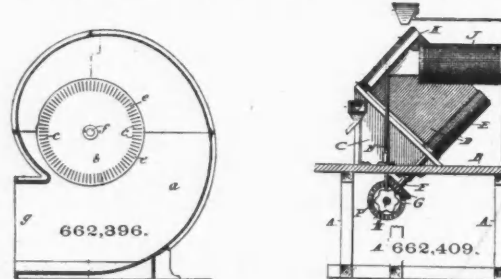
PATENTS RELATING TO MINING AND METALLURGY.

UNITED STATES.

The following is a list of the 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 Scientific Publishing Company upon receipt of 25 cents.

Week Ending November 27th, 1900.

- 662,392. METHOD OF MAKING METAL WOOL. Friedrich W. Buhne, Freiburg, Germany. The method consists in cutting a plurality of chips from the edge of a metal band in the direction of the grain, the thickness of said band being a multiple of the thickness of the chip.
- 662,396 and 662,397. CENTRIFUGAL FAN OR PUMP. Samuel C. Davidson, Belfast, Ireland. A centrifugal fan or pump, comprising a rotary member having numerous elongated blades arranged lengthwise in approximately axial direction, and in substantially drum form, so as to inclose within them a relatively large and practically unobstructed intake chamber, said blades arranged radially of the axis of rotation, so that when revolving in either direction they shall carry the fluid with them rotatively and discharge it tangentially, and a means for so mounting said rotary member as to permit the tangential escape of the fluid discharged from the said blades.
- 662,408. METHOD OF MANUFACTURING BRICKS FROM LIME AND SAND. Ladislaus Galecki, Paul Lopatin and John Lopatin, Warsaw, Russia. The process consists in mixing together a heavy bituminous substance and soda, adding thereto cream of lime to produce a binder, mixing said binder with sand, and molding and drying the resulting product.
- 662,409. APPARATUS FOR SEPARATING GOLD FROM MAGNETIC SANDS. Elmer Gates, Chevy Chase, Md., assignor to Theodore J. Mayer, Washington, D. C. Apparatus for separating gold from

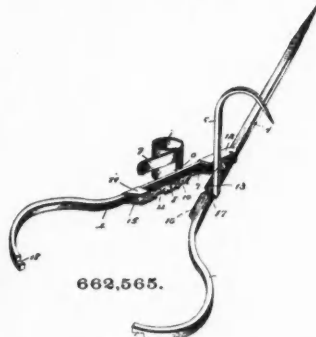
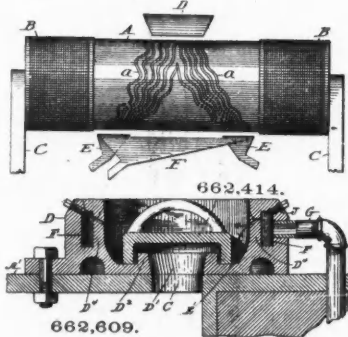


magnetic sand, comprising a magnet having a pole-piece whose field of force is of a wavy or zigzag contour, means for energizing said magnet just sufficiently to cause the same to lose its otherwise amorphous arrangement and to assume the arrangement of frond-like structures, an apron extending across the magnetic field and over which the material is fed, and means for causing said apron to travel in a direction transverse to the feed of the material thereon.

- 662,410; 662,411; 662,412; 662,413 and 662,414. MAGNETIC SEPARATOR. Elmer Gates, Chevy Chase, Md., assignor to Theodore J. Mayer, Washington, D. C. A magnetic separator, comprising a magnetic cylinder having grooves or recesses in its periphery, said grooves

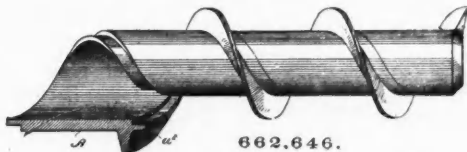
or recesses having a zigzag or wavy arrangement, so as to provide corresponding wavy or zigzag magnetic fields of force, a traveling apron passing over said cylinder, and interposed rotary shell between the cylinder and apron.

- 662,445. **ROLL-RELIEVING DEVICE.** Cornelius Kuhlewind, Knoxville, Pa., assignor to the Hydraulic Valve and Regulator Company, Limited, Pittsburg, Pa. A relief device having a vertically-movable block, a screw arranged to be forced endwise by the movement of the block, a non-rotatable innerly-screw-threaded socket surrounding the screw, and a yielding-pressure device acting upon the screw.
- 662,459 and 662,460. **INJECTOR.** Horace T. Nice, Wadsworth, Ohio. The combination of an overflow valve adapted to be opened by overflow on the receiving side of the injector, a device adapted to be actuated by the pressure of the delivery side to close said valve as the forcer is established, and lever connections between said device and valve.
- 662,481. **MANUFACTURE OF MANTLES.** Oscar Wiederhold, East Orange, N. J. A mantle comprising in its structure a refractory oxide having an affinity for oxygen, and a substance associated therewith capable of combining with oxygen to prevent further oxidation of the oxide, whereby shrinkage of the mantle is prevented.
- 662,502. **PROCESS OF HARDENING IRON OR STEEL.** Ludwig Schiecke, Magdeburg, Germany, assignor to Otto Gentsch, same place. The process consists in heating the piece to be hardened within a coating composed of pounded charcoal, corn-flour, slaked lime and neat's foot oil; then cooling the red-hot piece in water, with an addition of sal ammoniac and a layer of oil to exclude the air; then sinking the piece into a mud of argillaceous substances contained at the bottom of the vessel until the cooling is complete.
- 662,525. **CENTRIFUGAL FAN OR PUMP.** Samuel C. Davidson, Belfast, Ireland. A centrifugal fan or pump, comprising a rotary member having numerous elongated blades arranged obliquely to the axis of rotation, and in substantially drum form, so as to enclose within them a relatively large and practically unobstructed conical intake chamber, and in transverse section arranged, relatively to the axis and direction of rotation, to carry the fluid with them rotatively and discharge it tangentially, and a means for mounting said rotary member as to permit the tangential escape of the fluid discharged from said blades.
- 662,537. **ELECTRIC SMELTING FURNACE.** Hugo Koller, Nuremberg, Germany. An electric furnace having vertically-disposed current-feed electrodes, a vertical series of superposed disconnected hopper-shaped electrodes, arranged between said feed electrodes, and means for insulating them one from the other and from the current-feed electrodes.
- 662,548. **PROCESS OF MANUFACTURING METALLIC SILICON.** Bernhard Scheid, Frankfurt-on-the-Main, Germany. The process of manufacturing crystallized silicon, which consists in mixing silicic acid, carbon, and a silicate of the alkalies, alkaline earth, or earths, and heating the mixture to such a temperature and under such conditions as to cause the production of silicon and avoid its volatilization and the formation of silicon carbon simultaneously therewith.
- 662,565. **MINER'S CANDLESTICK.** Alfred Howard and Joseph Howard, Ouray, Colo. A miner's candlestick, comprising a piercing member having a cutter, and a coating member pivoted thereto having a lateral under flange, a lateral top flange at one end, and a



lateral top flange opposite one portion of the cutter, the former member having a portion of its cutting blade adapted to engage with said under flange, and a portion having its cutting edge adapted to enter between said opposite top flange and said under flange.

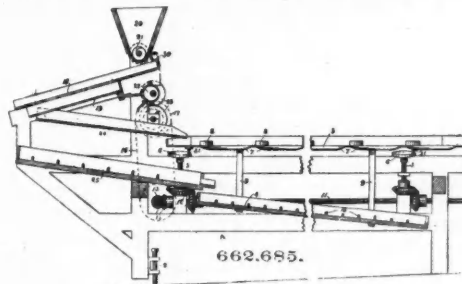
- 662,574. **AIR CONVEYOR.** Eugene L. McGary, Pittsburg, Pa. In an air conveyor, comprising a conduit and a table having an air passage formed therethrough, the combination with said table of a covering strip running horizontally with said table, but adjustable laterally with relation to the air passage thereof; and means for securing said strip.
- 662,609. **GAS PRODUCER.** Johan O. E. Trotz, Worcester, Mass. A device combined with the cover over each poke hole, comprising a frame having a central, vertical opening therethrough and an annular chamber provided with a series of inclined ports, arranged at short distances apart, and pointing toward said poke hole; said frame also being provided with inclined openings; the frame also having a steam-supply pipe connected with its annular chamber, and a suitable poke-hole cover.
- 662,633. **KILN FURNACE.** Louis Vinez, Louisville, Ohio. The combination of a kiln wall provided with an arch, said arch located only in the outer portion of the kiln wall, an inclined back wall located directly over the arch and extended upward and inward in an inclined direction from the arch, jamb walls located upon either side of the inclined back, said jamb walls diverging from the inclined back, parallel walls and a pocket wall located below the inclined back.
- 662,646. **COAL DRILL.** Martin Hardscog, Ottumwa, Iowa. A drill made from a strip of metal provided on its outer face with a continuous longitudinal triangular-shaped rib, and having its edges formed



to engage one with the other, for the winding of the strip on itself to bring the edges into engagement and form a hollow body having a smooth interior for the drill, and to cause the rib to

form a continuous elevating spiral on the exterior face of the body.

- 662,643. **WALL PLASTER AND CEMENT FOR BRICKWORK.** William S. Griswold, Elyria, Ohio. A composition of matter comprising calcined gypsum, cement, shale and limestone in combination in the proportions specified, and in which is incorporated suitable fiber and stucco retarder.
- 662,672. **CHUTE CLOSURE.** John S. Hickey, Anaconda, Mont., assignor of one-half to James H. Egbert, same place. The combination of a bin for ore, coal or the like, a discharge chute connected with said bin, a cut-off gate disposed transversely in said chute and movable in a right line thereon, said gate and the bottom of said chute being arranged at an acute angle with relation to each other and converging in the direction of the lower line of force represented by a moving mass descending the chute, the discharge portion of the chute extending beyond said gate, a motor connected to said gate and adapted to force the same through the said mass of material and thereby close the chute, and a hinged, counterweighted apron at the discharge end of the chute.
- 662,674. **HYDRAULIC BRICK PRESS.** Julius J. Koch, St. Louis, Mo. The combination of an upper moving ram cylinder, a stationary ram, a moving auxiliary-raising cylinder, a stationary piston therefor, and tie rods connecting the ram cylinder and the auxiliary-raising cylinder together.
- 662,685. **SEPARATOR AND AMALGAMATOR.** Ira P. Clarke, Alameda, Cal. An apparatus consisting of one or more tables, over which the



material to be acted upon is caused to pass, shafts having their upper ends inclined toward each other, and crank pins carried thereby and connected with the tables, whereby a gyratory motion of the table is produced.

- 662,697. **DISTILLING AND CONCENTRATING APPARATUS.** William L. Rowland, Philadelphia, Pa. In an ammonia distilling and concentrating apparatus, in combination, a primary and a secondary still, the latter placed vertically above the former, a pipe leading from said secondary to said primary still, a valve on said pipe, U-shaped steam connections, one end of which is open to the top of primary still, and the other ends of which are open to the secondary still, near its bottom; a concentrating column, a weak-liquor tank placed above the concentrating column, a feed tank placed between said weak-liquor tank and said concentrating column, a float valve automatically controlling the flow of liquor from the liquor tank to the feed tank, a condenser consisting of a vertical shell enclosing vertical condensing pipes and a condensing liquid, an absorber connected with the lower ends of said condensing pipes, and a receiver beneath said absorber.
- 662,709. **CONVEYER.** Arthur C. Clay, London, England. The combination of parallel endless chains, supporting and driving wheels for the chains, the wheels for one chain being in advance of those for the other chain, and a traveling table attached to the chains, the points of attachment being on opposite sides of the table and separated by a longitudinal distance equal to the advance between the two sets of wheels.
- 662,731. **MINING ELEVATOR.** Robert Lee, Sherrard, Ill. A shaft gate arranged to open and close a chute or pocket, having a pendant angular extension adapted to be engaged by the bottom of the elevator bucket in its descent.
- 662,791. **METHOD OF UNITING METAL SURFACES BY MEANS OF FLUID PRESSURE.** Carl Huber, Karlsruhe, Germany. Hermetically enclosing the contiguous surfaces to be united by the application of plastic impervious packing material over the meeting edges of the surfaces and subjecting the whole to liquid pressure in a chamber.
- 662,815. **IMPACT TOOL.** Thomas H. Phillips, St. David, Pa. The combination of the cylinder and its piston, having a steam-supplying groove, the valve chest and its valve, and steam inlet and exhaust passages whereby the piston controls the flow of steam into the valve chest.
- 662,836. **APPARATUS FOR REFINING AND DESILVERIZING LEAD.** Stephen Tredinnick, Butte, Mont., assignor of one-fourth to Adolph Weststein, same place. An apparatus comprising a series of kettles, means for connecting the kettles for effecting the discharge of the contents of one into another, hydraulic cylinders on which the kettles are mounted, a fluid tank, a pump, connections between the tank and pump and pump and cylinders to supply fluid to raise the cylinders, and connections for exhausting the fluid from the cylinders back to the tank.
- 662,884. **HYDRAULIC AIR COMPRESSOR.** Fred C. Starke, Milwaukee, Wis., assignor of two-thirds to Claude L. Franklin and John K. Russell, same place. The combination of a compressed-air chamber, an ascending water conduit into which said chamber opens at the bottom, a spreading-table in said chamber, above the outlet opening at the bottom thereof, a descending conduit having a water-intake opening and air inlet at the upper end and a lateral-outlet opening at its lower end which projects into one side of said chamber over said table and is directed across said table toward the opposite side of said chamber and an air-delivery pipe leading out of the upper part of said chamber.

GREAT BRITAIN.

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

Week Ending November 3d, 1900.

- 20,658; 20,659 and 20,660 of 1899. **COKE MAKING.** P. Naef, New York, U. S. A. Improvements in the manufacture of gas and coke, whereby the process is hastened and the output of ammonia increased.
- 20,661 of 1899. **ELECTRIC LAMP.** Societe Anonyme de Commentry Fourchambault, Paris. Method of using nickel-steel wire in incandescent lamps in place of platinum, for conducting the electric current through glass.
- 5,542 of 1900. **MINER'S LAMP.** C. Darrah and J. G. Patterson, Manchester. Improved arrangement of the gauze cones in miners' safety lamps.
- 14,985 of 1900. **LEAD OXIDE MAKING.** A. G. Tell, New York, U. S. A. Manufacture of lead oxide direct from lead ores.

PERSONAL.

Mr. Malcolm McLeish, cyanide expert, is in San Francisco.

Mr. F. Aug. Heinze, Butte, Mont., has been at the Waldorf-Astoria Hotel in New York City.

Mr. Gottl. Haist, the veteran civil and mining engineer, is very ill at his home in Virginia City, Nev.

Prof. John C. Smock, for the last 10 years geologist of the State of New Jersey, has tendered his resignation.

Mr. Richard McBride, provincial minister of mines, has been visiting the various mining centers of British Columbia.

Mr. Florencio E. Monteverde, Jr., mining and electric engineer of Hermosillo, Mexico, is visiting friends in San Francisco.

Mr. J. P. Corbus, superintendent of the Alaska-Treadwell Mine, Douglas Island, Alaska, has gone to California for the winter.

Mr. W. A. Roberts, of Boise City, Idaho, who is interested in mines in the Coeur d'Alene District, is at the Hotel Imperial, in New York City.

Mr. A. B. Campbell, of Spokane, Wash., who is interested in mines in the Coeur d'Alene and Buffalo Hump district, Idaho, has been in New York City.

Mr. Robert Henry Jeffery, representing the Globe Mineral Exploration Company, of London, England, is examining mining properties in North Carolina.

Mr. M. J. Hollinger, chemist of the Alma Portland Cement Company plant at Wellston, O., has gone to Caledonia, N. Y., to direct the building of a new plant there.

Mr. J. Clark, formerly with the Waihi Silverton Company, of New Zealand, has taken charge of the cyanide plant at the Longfellow Mine in Tuolumne County, Cal.

Mr. Leonard E. Sivyer, of Spokane, Wash., who has been examining mines at Black Hawk and Breckenridge and Cripple Creek, Colo., expects to be back in Spokane by Christmas.

Mr. Geo. N. Nolan, of Los Angeles, Cal., has tendered his resignation as secretary of the Southwest Miners' Association and Mr. James H. Fountain has been appointed to that office.

Mr. D. S. Fotheringham, assistant manager of the Northport Mining and Smelting Company, of Northport, Wash., has placed his resignation in the hands of the directors of the company.

Mr. Arthur Hauman, late chemist for the Newton Copper Company, accepted a position as Tutor of Mining and Metallurgy at Van der Naillen's School of Engineering, San Francisco.

Mr. S. Y. Mori, of Tokio, Japan, proprietor of an extensive fertilizer industry near Tokio, was in Beaufort, S. C., recently, and, it is stated, negotiated for large quantities of phosphate rock.

Capt. H. G. Merry has resigned his position as manager of the Low Moor Iron Company, Clifton Forge, Va. His place has been filled by Mr. S. G. Cargill, who has been connected with the company for several years.

Mr. L. C. Trent, of Salt Lake City, Utah, has been selected to design and erect a smelting and reduction works for the North Mount Lyell Company, Tasmania. He will leave the United States by the end of January.

Mr. Arthur Boyd, who took charge December 1st as superintendent of the Boomer Coal and Coke Company, at Boomer, W. Va., will return on December 15th to his former position as surveyor for the Pere Marquette Coal Company at Saginaw, Mich.

Dr. L. D. Godshall, superintendent of the Boston-Wyoming Smelter, now in course of construction at Grand Encampment, Wyo., has recently been appointed resident manager of the Kurtz-Chatterton Copper Mining Company, of the same place.

Mr. James W. Neill announces that, owing to pressure of his private business, he has severed his connection with the Taylor & Brunton Ore Sampling Company, of Salt Lake, and will in future devote his entire time to consulting work. His headquarters will be, as heretofore, in Salt Lake City.

Mr. L. Knight, the former American representative of Messrs. Ward-Lock & Company, of London, has just returned from a prosperous tour in India, Japan and Australia, in the interest of several large American publishing houses. He can be addressed care of "The Engineering and Mining Journal."

Messrs. Charles Godfrey, president of the Consolidated Gas Company of New York; A. H. Bradley, chief engineer of the same company, and

James Perkins, of New York, last week visited coal mines in the Pittsburg District and in the Connellsville Region, Pennsylvania; also the principal works of the Carnegie Steel Company.

Mr. C. C. Sharp, of Corning, O., who recently resigned as general superintendent of the Sunday Creek Coal Company, expects to open a mine for himself on the Kanawha & Michigan Railway, between Charleston and Gauley Bridge, W. Va. He will also act temporarily as superintendent and engineer for the Boomer Coal and Coke Company.

Mr. Thomas C. Mayon, of the Apollo Mine at Unga, Alaska, has resigned after 11 years of continuous service. He is succeeded by the foreman, who has served the company for 10 years. Mr. F. R. Brown. Mr. Mayon will devote his attention to the development of some very promising coal lands which he has been prospecting for the past few seasons at Chignik Bay.

Mr. Charles Conner, Mine Inspector of the Fifth Bituminous District, Pa., has gone to Nova Scotia, where he will make a report on a tract of coal land, the property of the Dominion Iron and Steel Company, of which Charles McCreery, the former manager of the Dunbar Furnace Company and later of the Carnegie furnaces at Duquesne, is manager. Mine Inspector Conner goes north at Mr. McCreery's request.

Mr. Edw. H. Coxe, superintendent and engineer for the Jones & Adams Company, of Chicago, has been looking over some coal lands in the Fairmont region of West Virginia in the interest of Columbus, O., and Chicago, Ill., parties. He also examined and reported upon the physical condition of the mines in the Sunday Creek Valley, Ohio, operated by the Franklin Fuel Company, of Columbus, O. He will take up his residence at Springfield, Ill., on December 11th.

OBITUARY.

Orange Merwin Loveridge, one of the oldest citizens of Trinity County, Cal., died at the Sweepstake Mine on Oregon Mountain recently. He had been engineering the preliminary survey of the Sweepstake Company's proposed new ditch from Canyon Creek, and was engaged in overseeing the erection of the buildings on the mine.

SOCIETIES AND TECHNICAL SCHOOLS.

Columbia University.—A relief map of the United States, thought to be the largest of its kind ever made, has been added to the equipment of the department of geology. It is modelled on a section of a globe 16½ ft. in diameter, with the horizontal scale 40 miles to the inch. The vertical scale is 8 miles to the inch.

Massachusetts Institute of Technology.—A base-measuring apparatus perfected in connection with the summer school work of the civil engineering department of the Massachusetts Institute of Technology has recently been tested by the Coast and Geodetic Survey in Washington. Such satisfactory results have been already obtained that the apparatus is about to be used in the important Lampasas Base in Texas. Professor Burton, of the Institute, under whose direction the apparatus has been worked out, has been invited to accompany the expedition which is to make a careful field trial. The apparatus represents the final results of thesis investigations by several graduates of the course in Civil Engineering. One part of the apparatus maintains a constant tension in the steel tape while in use. Another part of the apparatus determines very accurately the mean temperature of the tape by measuring its electrical resistance by means of a special form of thermophone. The complete apparatus is not bulky and is of high value for exact measurements.

American Chemical Society—New York Section.—The regular meeting of the New York Section of the American Chemical Society was held December 7th at the Chemists' Club. The feature of the meeting was an address by Prof. Wm. P. Mason, of the Rensselaer Polytechnic Institute, of Troy, entitled "The Water Supplies of the Cities on the Mediterranean," with lantern illustrations. The speaker stated that the system at Naples, once so primitive and unsanitary, is now of a character to command admiration. The typhoid epidemic at Hamburg in 1892 was alluded to, and a map gave a graphic representation of the severity of the scourge and the comparative immunity of the adjoining town of Altona, which, having a separate water supply, was not more separated from Hamburg than Harlem from the rest of New York City. The water supply of Altona was taken from below the sewers of Hamburg, passing through sand filters before distribution.

A committee of three—T. J. Parker, A. P. Hallock and William McMurtrie—was appointed to confer with the Bureau of Combustibles in regard to the present existing restrictions as to

storage of nitric, hydrochloric and sulphuric acid in New York City. At present a permit can be obtained for 1,000 lbs. only of the acids, whereas many establishments are using more than this amount every 24 hours, and, aside from the difficulty of having the acids delivered each day, any interference with daily delivery would result in suspension of large and important industries.

INDUSTRIAL NOTES.

The Canadian General Electric Company has absorbed the Royal Electric Company of Montreal.

The E. P. Allis Company, of Milwaukee, Wis., has been awarded the contract for 7 Scotch marine boilers, for the new plant of the American Smelting and Refining Company at Murray, Utah.

The Carnegie Steel Company, of Pittsburg, Pa., has sold 6,000 tons of steel rails, with sufficient splice-bars and fastenings to lay the same, to the Great Eastern Railway Company, London; shipments to begin at once.

The Manchurian Railroad Company recently contracted with the Ingersoll-Sergeant Drill Company, of New York City, for machinery and tools for use in boring a tunnel 1½ miles long at Charbin, Manchuria. The contract price is \$600,000.

Brick-making in and about Boston, Mass., is henceforth to be controlled by the New England Brick Company, which takes in all the prominent and numerous minor yards in New England. Cambridge men are to be the prominent officials of the company.

The Parkersburg (W. Va.) Iron and Steel Company has broken ground for a new plant to manufacture iron and steel sheets. The various buildings will be steel frame covered with corrugated iron, after the designs of Wm. B. Scaife & Sons, Pittsburg, Pa., who also have the contract for their construction and erection.

It is said that W. R. Rannie and A. R. Sheffer of New York, in the interest of a British syndicate, have examined the Carpenter Steel Works at Reading, Pa., with a view of purchasing them for the men they represent. The plant of the Brooke Iron Company at Birdsborough, and the Pottstown Iron Mills have also been inspected by the same men.

During the past 10 days the Robert Aitchison Perforated Metal Company, of Chicago, states it has closed a contract with one of the large thresher manufacturers of the Northwest for the season's supply of perforated metals, and also closed a contract for over 60,000 sq. ft. of perforated steel for malt machinery. The company reports business very good.

The J. H. Montgomery Machinery Company, of Denver, Colo., has sold an equipment for a mill at Lake City, Colo., ore cars, chains, hooks, etc., to go to Chihuahua, Mex., two 2-H. P. whips for Parral, Mex., one Penfield plunger brick machine and all necessary fittings to Robinson & Company, Arapahoe County, Colo., and a lot of ore cars, track, etc., to J. H. Laden & Company, Boulder, Colo.

The management of the Grand Trunk Railway system has built a mammoth coal chute to cost \$60,000, at Portland, Me., from which point the Sydney, C. B., coal intended for consumption on its system is to be distributed. It is the intention of the company, not only to handle its own coal, but also considerable quantities intended for commercial purposes. The capacity of the chutes is 3,000 tons daily.

The Bullock Manufacturing Company, of Cincinnati, has taken a large contract for electrical machinery amounting to \$100,000, and is furnishing a complete electrical equipment for the McCloud River Electric Power Company, Shasta, Cal. The contract calls for 4 generators of a total capacity of 2,000 K.W., and the current will be transmitted 30 miles to the large copper mines just south of Shasta. The plant is located in the position selected because of the water advantages.

The J. T. Taylor Manufacturing Company, of Mount Holly, N. J., manufacturer of turbine wheels and accessories, is enlarging its plant. A 2-story addition, 72 by 45 ft., has been made to the machine shop, and the foundry has been enlarged 40 by 45 ft. A new erecting shop, 68 by 96 ft., is now being built and will be equipped with a traveling crane. A blacksmith shop and a warehouse are also to be built. The company recently installed a turbine plant at Flemington, N. J., and another of 200 H. P. capacity is going to Wilton, Me.

The Paris agent of the Rand Drill Company reports that all the compressors and drills which were on exhibition at the exposition have been sold. The large Corliss compound compressor at Vincennes was purchased by the firm of

Messrs. J. & A. Niclauss, the manufacturers of the famous Niclauss water tube boilers, by whom it is to be used for the operation of pneumatic tools in their extensive establishment. This is the compressor which supplied the compressed air to all the American exhibits at Vincennes.

The Arthur Fritsch Foundry and Machine Company, of St. Louis, reports that it is well supplied with orders both in its machine shop and foundry departments. It is building cast-iron jigs for the lead and zinc mines in Southwest Missouri; an ice machine plant for O'Fallon, Ill.; a fuel compressor for making fuel out of corn cobs; five 10-ton ice machines for the McKay-Wilson Manufacturing Company, St. Louis, and has just about finished a 120,000-lb. press for pressing tallow for the Goodwin Manufacturing Company, of St. Louis.

The contract for the complete lighting plant of the city of Detroit, Mich., has been let to the Northern Electrical Manufacturing Company, Madison, Wis., for \$35,865. The apparatus called for is to be of Northern and Stanley make. The bids of but 3 companies were considered, namely: The Westinghouse, the Northern, and the General Electric. The closeness of the bids of the 3 concerns was remarkable. The plant will be one of the most complete municipal installations in the country. It may be worth saying, in view of the small differences in price on the above bids, that it is a favorable indication of careful estimating, showing that the larger electrical companies have arrived at a more exact basis of manufacturing and construction cost and are therefore doing a great deal less guess-work than formerly.

The I. X. L. Company, of Pearl, Idaho, has purchased of the Colorado Iron Works, of Denver, Colo., material for a high-speed roller crushing plant, including elevators, screens, Bartlett tables, engine and boiler; the Middlemarch Copper Company of Arizona has ordered a hoisting plant of the company; the British-Globe Mines Company, of Sonora, Mex., is being furnished a 36 by 68-in. silver-lead smelting furnace, with the Nesmith patent water vaporizer, and an English cupelling furnace; the Philadelphia Smelting and Refining Company, at Pueblo, Colo., has placed an order for 6 large slag trucks of special design. The Colorado Iron Works Company is also furnishing water jackets for the furnaces of the Arkansas Valley Smelter at Leadville, Colo., and is building a 10-stamp mill for the Cochiti Reduction Company at Bland, N. M.

TRADE CATALOGUES.

A recent issue of "Graphite," published by the Joseph Dixon Crucible Company, of Jersey City, N. J., states that Dixon's pure flake graphite as a lubricant can be used in an ordinary clean squirt-can effectively and conveniently.

"Ideal" engine governors are described in supplement 45 to the general catalogue of engines issued by A. L. Ide & Sons, of Springfield, Ill. The governors used on "Ideal" engines, the pamphlet states, are the Rites governors, which are so well known as to need no extended descriptions. Simplicity of design is combined with great care to quality of material and attention to all details of construction.

"Charter" gas and gasoline engines are described in pamphlets and circulars published by the Charter Gas Engine Co., of Sterling, Ill. A combined engine and double acting pump made by the company is of compact design, entirely self-contained, and, it is said, can be set up in any place in a few minutes. The pump has a brass lined cylinder. The engine is of 3½ or 4 H. P., the pump cylinders being of several sizes for different lifts. For pumping from deep wells the company puts out self-contained rigs of 3 to 14 H. P. that can be readily attached to any deep well pump head.

The Steamloop and Holly gravity return system for returning to the boiler all water of condensation from steam pipes is described in a 56-page pamphlet published by Westinghouse, Church, Kerr & Company, of Pittsburgh, Pa. The system is stated to be applicable to stationary and marine practice and to all forms of dry kilns, hot rooms, boiling vats with steam jackets, etc. Its merits are said to be that it saves the water of condensation, entrainment, and primage, prevents loss in clearing pipes of water, returns pure water to boilers, prevents accidents from water in cylinders, reduces the amount of cylinder oil necessary, etc.

The Epping-Carpenter Company, of Pittsburgh, Pa., has issued a very neat 60-page catalogue of pumping machinery. The catalogue shows a great variety of styles suited for all manner of work. The company claims simplicity of construction, certainty of action, economy in operation and durability in all the pumps described and states that each pump is guaranteed to perform properly the work for which it is intended. It calls attention to the balanced piston and

lost motion adjustment as features possessed by no other pumps. Boiler feed pumps are shown, as well as compound pressure pumps up to 18 by 30 in. and 30 by 10 by 24 in.

MACHINERY AND SUPPLIES WANTED.

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

We also offer our services to foreign correspondents who desire to purchase American goods of any kind, and shall be pleased to furnish them information, catalogues, etc.

All these services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, and have no pecuniary interest in buying and selling goods of any kind.

GENERAL MINING NEWS.

ALASKA.

Juneau District.

(From Our Special Correspondent.)

Such a cold snap in November as has just occurred is exceedingly rare here. For the past 5 years 22° is the coldest temperature for the month, while this year the mercury went as low as 4° above and stayed for a week or more. As no snow had fallen water power was generally cut off. The 300-stamp mill at the Treadwell closed down, as did the Eban mill in Gold Creek Valley. Both have since started again. The Windham Bay Gold Mining Company's new mill at Windham Bay has shut down for the winter. Work at Snettisham on the new 40-stamp mill has been seriously hampered, owing to delays in delivering machinery from the East. The mill proper is finished, but the rock crusher and ore bins are not ready. Development work on the big ledge has gone steadily forward.

ARIZONA.

Pima County.

(From Our Special Correspondent.)

Liberty.—This mine, south of Tucson, owned by a private corporation of Brooklyn, N. Y., people, is putting in a gasoline hoist of Fairbanks & Morse Company's make to sink 500 ft. on the contact vein. The ore carries silver, lead and copper, and last shipment to smelter gave \$321 per ton, showing 505 oz. silver. The mine has been chlorided for years by former owners, who took out some \$50,000, though lowest workings were not over 70 ft. The present manager, Col. Wemple, is going to sink at least 500 ft., believing the vein a true fissure.

CALIFORNIA.

Amador County.

(From Our Special Correspondent.)

Mitchell.—A new Gates crusher has been put in at this mine near Pine Grove, and as soon as the water pipes are connected will start, adding to the capacity of the 10-stamp mill which is now running continuously.

Calaveras County.

(From Our Special Correspondent.)

Deep Gulch.—This quartz mine in Chile Gulch, near McSorley's Place, owned by Kiser & Nunes, has been bonded to L. C. Clark, of San Francisco, for \$3,000.

Del Monte.—The 900-ft. tunnel on the ledge has been completed to the shaft at a depth of 200 ft. At 220 ft. a drift has been run 200 ft., showing a 3-ft. ledge which assays well. The assays in the tunnel range from \$12 to \$50 per ton. A new hoist is to be put in and sinking continued to the 500-ft. A 10-stamp mill is on the property, which is located 5 miles from Railroad Flat.

El Dorado County.

(From Our Special Correspondent.)

Maggini.—This property is an extension of the Hart Mine near Garden Valley. A bond has been taken by Messrs. Hughes, Davey & Simpson, who are preparing to do extensive development work.

Inyo County.

(From Our Special Correspondent.)

Emily Enid and Bonanza Jim.—These mines, 5 miles southeast from Bishop, have been bonded to Ashford & Inman, of Randsburg, for 6 months from January 1st, work to start within 30 days. There is a large body of low-grade ore, with plenty of water for power.

Madera County.

(From Our Special Correspondent.)

Buchanan.—These old copper mines about 8 miles east from Raymond have recently been reopened by Grider & Irvine. There are said to be 6 leads of ore in the tunnel and a large body of ore in sight. Sixteen men are at work and 3 car-loads of rich rock have been shipped to the smelter.

Mariposa County.

(From Our Special Correspondent.)

Mariposa.—The shaft is down about 750 ft.

and stoping is now under way at the first and second levels. The 20-stamp mill will be completed in a few days, the stamps and batteries and concentrators being in position, and the buildings completed.

Nevada County.

(From Our Special Correspondent.)

Empire.—Part of the working force at this mine, east of Grass Valley, has been laid off and only 20 stamps will be kept going while the repairs on the mill and the mining plant are being made. A new hydraulic pump has been installed, and a pipe line connecting with the South Yuba Company's water supply at Brunswick, constructed. In future all the machinery will be run by water power.

Plumas County.

(From Our Special Correspondent.)

For several weeks a Keystone driller has been prospecting at Spanish Ranch and vicinity, but work has stopped for the winter. The result has been so satisfactory that options on the properties of G. H. Maurer, S. S. Taylor, J. Yager and Thompson & Kellogg will be closed and the properties taken. Gold dredgers will probably be installed.

Riverside County.

(From Our Special Correspondent.)

Pinon.—This property in the Pinon District, 25 miles north from Indio, has been purchased by Ertel & Glove, of Los Angeles, who intend to install machinery and work the large body of tailings before continuing development. The old works consist of 2 shafts, one 75 ft. and the other 100 ft. deep, besides about 400 ft. of tunnels. C. E. Fischer will be superintendent.

San Diego County.

(From Our Special Correspondent.)

American Girl.—A 100-ton cyanide plant is being installed at this mine near Hedges and other improvements are being made. H. H. Markham is owner.

Picacho.—It is stated that a large cyanide mill is to be erected for this gold mine on the Colorado River. Among the owners of the mine who recently visited the mine with a view to arranging for the placing of the plant are Senator J. P. Jones, of Nevada; ex-Senator Stephen W. Dorsey, J. Harry Carpenter, of Arizona, and others. The plan includes building a railroad from the mine to the mill.

Shasta County.

(From Our Special Correspondent.)

Three Sisters.—This gold property, comprising 4 claims, in Dutch Gulch, 2 miles northwest from French Gulch, has been bonded for one year by Stoufer, Vinnege & Hammond, of Chicago, and Tom Motherwell, of French Gulch. Price is said to be \$10,000. The mine has produced about \$90,000. Arrangements are being made to continue development work. A mill and a canvas plant are now on the property.

Siskiyou County.

(From Our Special Correspondent.)

River mining in this county has been completely suspended since the recent storms, as heavy freshets may occur at any time and wreck machinery left in the river.

Trinity County.

(From Our Special Correspondent.)

Ajax.—A force of men has been put at work on this group of mines in Oregon Mountain. C. D. Galvin, who holds the bond, will prospect for an ancient channel believed to exist on the property.

Tuolumne County.

Santa Ysabel.—According to reports received at the Boston office the station at the bottom of No. 1 shaft is completed, the air drills in position and the main work of development, a crosscut to the vein, begun. This should take about 6 weeks. In the meantime a considerable body of low-grade ore has been discovered in the old workings on the second level near No. 2 shaft.

(From Our Special Correspondent.)

App.—The additional 40 stamps being installed at this mine at Quartz Mountain the mill will be ready to begin crushing early in January. Eight concentrators and 2 rock-breakers have been put in and the shaft track relaid with 20-lb. rails. Everything is in shape for a long run.

Draper.—Sixteen men are employed at this mine, west of Soulsbyville, and sinking has been resumed. New pumps are on the ground and the mill is going up.

Dutch.—The ledge at this mine at Quartz Mountain has been cut on the 1,000-ft. level and an upraise has started from the 1,000 ft. to meet a winze which is being sunk from the 900-ft. The canvas plant has arrived and the cyanide plant is ready to start. A. Trittenbach is superintendent.

Golden West.—Another rich ore shoot is reported struck at this mine near Soulsbyville. The machinery for a 10-stamp mill is being hauled in. The intention of the management is to sink a 2-compartment shaft 1,000 ft.

Longfellow.—The 30-ton cyanide plant at this mine at Big Oak Flat has been completed and has been turned over to J. Clark, who will operate it for the company. The tailings are taken direct from the plates. The plant was installed by W. Oaks Kibbie, of New Zealand.

Over.—The tunnel at this mine on the north-westerly slope of Bald Mountain is in 250 ft. in a very hard formation. It will be driven about 700 ft. further before cutting under the old workings. It will drain the mine and open up a valuable ore body.

Philadelphia Diggings.—At this hydraulic mine 10 miles northeast from Columbia, the tunnel is being pushed ahead to tap the gravel beds at the lowest possible point. A restraining dam has been constructed and the 15 miles of ditches put in order. Water will be brought from the South Fork of the Stanislaus River, and from Rose Creek. A Stockton company owns the property.

COLORADO.

Clear Creek County.

(From Our Special Correspondent.)

Lord Byron Mining Company.—This company, owning property at Idaho Springs, has secured an option and lease on the Mayflower Mine and Mill, the consideration to be \$60,000, and also taken the Niagara Claim on the south for \$15,000. The company has worked the Lord Byron Mine some time, but recently closed down because of water in the shaft. The Mayflower is acquired in order to drive the adit level on the Mayflower vein. It is now into the hill 400 ft. and an additional 500 ft. will crosscut the Bullion King at a depth of 1,000 ft. When this point is reached the tunnel will follow the Bullion King until the Niagara vein is cut, after which the Niagara will be followed to Lord Byron ground. To the Lord Byron shaft is about 7,500 ft. There is an air compressor and plant of machinery on the Mayflower which must be replaced with modern equipment. The mine is very promising. It has a shaft 230 ft. deep exposing a wide body of silver, lead and zinc ore. The Byron Company has about \$40,000 on hand for development work.

Seaton Mining and Milling Company.—In drifting on the vein through the Foxhall Tunnel, this company has opened about 5 in. of ore running \$440 a ton; also low-grade mill ore. There is a block of stoping ground above, about 400 ft. high and of unknown length.

Gilpin County.

(From Our Special Correspondent.)

Mining Deeds and Transfers.—J. H. Shepherd to The Sun & Moon Mining and Milling Company, the William Penn Lode; B. Schlessinger to W. H. Kimball, $\frac{1}{4}$ interest in Stewart Lode; Thomas Cody to H. Dempster, the Climax Lode; J. A. Iverson to J. E. Schorr, $\frac{1}{2}$ interest in Carrie M. group of 4 claims; C. F. Hendrie to The Burlington Real Estate and Investment Company, the Mechanics and Sapphire lodes; H. Bolthoff to The Burlington Real Estate and Investment Company, the H. B., M. B., Oro and James Henry lodes and real estate in Central City; A. Lute to G. B. Wilkinson, $\frac{1}{4}$ interest Cora Lode, $\frac{1}{16}$ interest in T. A. P., Fannie and Inn lodes, $\frac{1}{2}$ interest in Lulu Lode; L. B. Hall to Harvey S. Waldo, $\frac{1}{4}$ interest in British Lode; J. W. Cairns to A. B. Smith, $\frac{1}{4}$ interest in Balla Cloucas Lode; Wm. Job to E. W. Williams et al., the Good Luck Lode; Henry J. Seib to C. J. Knoch et al., the Twentieth Century Placer claims; Phoenix Mining and Mineral Land Company to Horace Phelps, land in Gilpin and Boulder counties; Plutus Gold Mining and Mineral Land Company to W. B. Connell, 330 acres of land.

Lake County—Leadville.

(From Our Special Correspondent.)

A newspaper correspondent who did not know the difference between a silver and a gold assay telegraphed the New York papers that gold had been discovered for the first time on Fryer Hill. The report is absolutely false. The strike was simply the finding of a streak of iron ore in the workings of the Aimee. Gold has never been opened at any time on Fryer Hill.

Arnold Mining Company.—This company, working the Rose-Emmett group in Graham Park slope, has encountered at the 475-ft. level a 4-ft. vein of good ore showing carbonate and iron. The main shaft has reached 575 ft. Another 100 ft. should put it into the lower contact.

A. V.—Sinking on this new proposition at the foot of Harrison Avenue has started with 3 shifts. A fine electric plant and other improvements have just been completed. The shaft is $4\frac{1}{2}$ by 11 ft.

Electric Drills.—For the first time in the history of the camp these drills are being used in the Resurrection and the tests are satisfactory.

Fortuna.—A good strike has been made through the Fortuna Tunnel in Iowa Gulch by new lessees. The ore shows 18 in. of lead carbonate averaging \$100 to the ton.

Home Extension Mining Company.—The new pumping machinery is about in position.

Iron Silver Mining Company.—During the management of T. E. Schwarz all the indebtedness has been paid off, and a fine concentrating plant erected. The Stevens shaft is now 700 ft. deep, and a large surplus for development purposes has accumulated. The ore is of low grade and conditions of long underground tramping and hauling by team to the railroad have been severe.

Penn Mining Company.—Shipments are heavy from all 3 shafts of the Breece Iron mines. An immense amount of development work is being done and No. 1 shaft is to be sunk another lift. A large plant of machinery is to be put in position and other improvements made.

Valentine Mining Company.—At No. 2 shaft a churn drill manufactured by the Keystone Drilling Company, of Pennsylvania, is being put in and will be used to explore the lower ore zones. A 6-in. hole will be sent down 2,000 ft. if necessary. At No. 1 shaft drifts are being run from the lower levels in the hope of encountering extensions of the iron ore shoots on the east.

San Juan County.

Kendrick-Gelder Smelting Company.—Fire is started in the new smelter, situated on Tower Mountain, $\frac{1}{4}$ mile above Silverton, on Cement Creek. This plant uses the Bretherton patent for pyritic smelting and is of 200 tons capacity. It was erected under the personal supervision of W. F. Kendrick, of Denver, manager of the company. The water power is taken from Cement Creek through a flume some 5,000 ft. long to a point directly above the works, whence it is carried 300 ft. down through steel pipes 22 in. in diameter to turbines, which furnish ample power. A machine shop, large sampling rooms and a fine assay outfit are connected with the smelter. A dust chamber leading from the blast furnace to a brick stack 100 ft. from the furnace is to be 8 by 8 ft. and 80 ft. long, and will be of bricks made of slag produced by the furnace. It will take 60 days to complete it. Car sheds, roof for the ore bins and other buildings are yet to be completed. The Silverton & Gladstone Railroad has trackage at the works for 50 cars, so arranged that 10 cars may be unloaded into the ore bins at one time. Car scales of 50 tons capacity are in place. All the ore bins, coke and coal are on the same floor with the feeding doors to the blast furnace. The smelting will be under the personal supervision of Ed. C. Walters, who recently returned from Mexico, where he was in the employ of the Guggenheims. He has full charge also of the sampling and assaying. The ores on hand at present consist of 2,500 tons from various mines. Contracts are in force from different mines insuring continuous supply if the roads can be kept open during the winter months.

Summit County.

North American Gold Dredging Company.—According to Boston dispatches, last spring Receiver Wing, of the Globe National Bank, was granted permission by Judge Lowell of the United States District Court to advance to the North American Company \$15,000, which, with \$15,000 advanced by other interests in the company, constituted a working capital. This money was used for operating purposes during the summer. The debts of the company amount to \$280,000, of which \$115,000 is owing to the Globe National Bank and \$50,000 to the United States Oil Company. Steps to reorganize the company are about to be taken.

Teller County—Cripple Creek.

The Jackpot, Roxanna, Doctor Ingham, Magnet Rock and Nugget Gold Mining Companies, owning 72 acres in a solid body on Raven Hill, have, it is said, consolidated. The new company will have a capitalization of 3,000,000 shares of \$1 par value, 500,000 shares being retained in the treasury. The following directors have been elected: H. E. Woods, Frank M. Woods, W. P. Bonbright, J. A. Hayes, Albert E. Carlton, John H. Hobbs, and A. W. Stevenson. The Woods Investment Company, Edsall Kay & Company and W. P. Bonbright & Company are associated in the deal. The deal ends litigation over apex and other rights.

Stratton's Independence.—There was a very stormy scene at the stockholders' meeting in London last week; personalities were exchanged, harsh language used and finally the majority of the stockholders left the hall in disgust. The stockholders were dissatisfied with the reasons given for the recent fall in the price of stock and there were intimations that some of the directors knew that the mine was being worked hard and development work curtailed excessively in order to keep up dividends. It was also intimated that all the directors should have had more accurate information concerning the real status of the mine. There is now, according to London dispatches, a movement started to have the Board of Governors of the Stock Exchange investigate the manner in which the company was brought out in London, and determine who is responsible for the glowing statements made

about the mine when it was being systematically overworked.

(From Our Special Correspondent.)

Anaconda Gold Mining Company.—There are 32 sets of lessees at work on various parts of the property and it is estimated that about \$3,000 per month is paid in as royalties. On December 7th an important strike was made at a depth of 850 ft. The vein is supposed to be the famous Mary McKinney shoot. Should the strike prove up what is expected, property holders on Gold Hill will be greatly encouraged.

Cripple Creek Consolidated Gold Mining Company.—At the annual meeting in Colorado Springs on December 3d, directors were elected as follows: J. F. Humphrey, president; D. J. Christopher, secretary; G. Shields, treasurer; J. A. Hayes and Geo. M. Irwin. The Ophelia Tunnel is now passing through the Boss No. 3 claim at a depth of about 600 ft. The principal work has been on the Florence, where the company in the past few months spent about \$16,000. The treasurer's report shows the amount of cash on hand \$12,701, with 17,925 shares of stock in the treasury, beside 200 shares of the Independence Consolidated.

Galena Hill.—This section of the district is looking well. Until quite recently it has been supposed to be outside the producing area. Lessee Kellum, working the Sunshine and Sedan, has sent out another shipment of good ore; it is also rumored that a strike has been made in the Colonial Dames Group, about 500 ft. distant from the Sunshine.

Jack Pot.—A drift is being run on the Jack Pot vein to connect with the Doctor and the Morning Glory shaft for ventilation. All 3 properties will work to better advantage after the connection is completed. Recently the Doctor was obliged to close down for a few days on account of bad air. It is understood that active mining will be resumed very soon on the Jack Pot. Arrangements are being made to hoist ore through the Morning Glory shaft. Both properties are controlled by the Woods Investment Company.

Keno and Crackerjack vs. the Pike's Peak Placer and Stars and Stripes.—This case has been decided in favor of the plaintiff. This is the 6th time the case has been up. The Keno discovery shaft was sunk on the Pike's Peak Placer and was known to be a lode when the placer was entered for patent, but was not excluded. The decision gives the plaintiff about 10 acres of ground in the western edge of Cripple Creek.

Lexington Gold Mining Company.—At the annual meeting in Colorado Springs, directors were elected as follows: J. S. Jones, president; C. C. Butler, vice-president; N. S. Partridge, secretary and treasurer; W. B. Storer and J. D. Bombeck. During the year 2,500 tons of ore, averaging \$29 to the ton were shipped from the property. The company has been expecting the Good Will Tunnel to cut its property, so only work that would not be covered by the tunnel has been prosecuted. The tunnel is now near the property and it is hoped that before long the company will be working from it at a depth of about 600 ft. The treasurer's report shows the amount of cash on hand to be \$18,623.

Orphan Gold Mining Company.—Suit has been filed in the district court by William E. Boyle for and in behalf of all other stockholders of the company and of the Orphan Mining and Milling Company vs. Nelson B. Williams, as president and director of the Isabella Gold Mining Company and the Isabella Gold Mining Company, defendants. The minority stockholders of the Orphan Bell and Orphan sue to set aside the lease granted Mr. Spurgeon a few days ago, and for the appointment of receivers for the Orphan Gold Mining Company, and Orphan Mining and Milling Company, and for an order compelling the Isabella Company to allow an inspection of its property. The plaintiff was granted an injunction restraining the defendants from any act affecting the property of the Orphan Gold Mining Company, or any of the lease or ground in controversy.

IDAHO.

Delhi.—This claim 8 miles from Boise is owned by W. A. Magee, of Pittsburg, Pa. D. H. Mosely is superintendent. A new hoist has been put in and sinking for the 400-ft. is under way.

Ada County.

North Star.—The 10-stamp mill on this mine, 12 miles from Boise, started up for the first time on November 30th, and is now running smoothly. The mine is owned by the War Eagle Consolidated Mining Company, of which R. J. Anderson is manager.

MICHIGAN.

Copper.

Old Colony Mining Company.—At the annual meeting in Boston, December 13th, the old board was re-elected as follows, 70,139 shares voting: H. F. Fay, Charles M. Baker, Wm. Howell Reed, John C. Watson, W. B. Mosman, Stephen R. Dow, James Chynoweth.

Copper—Houghton County.

(From Our Special Correspondent.)

Arcadian Consolidated.—The grading for the branch of the Mineral Range Railroad to the new shafts on the St. Mary's property is completed. These shafts are on the Mesnard epidote and good copper-bearing rock is encountered.

Atlantic.—The product for November was 263 tons, 835 lbs.

Calumet & Hecla.—The coal in this company's No. 1 shed at its docks at Lake Linden caught fire December 8th from spontaneous combustion. The shed contains about 85,000 tons and was built 3 years ago. The coal is being removed as rapidly as possible and the loss is expected to be comparatively small.

Franklin.—In the old mine the lode recently opened by a crosscut from the 19th level is reported rich in silver.

Quincy.—The first head at the new mill at Mason has gone into commission. The remaining 2 heads will be at work in a few months. This mill is the first in this district to dispense with finisher jigs and slime tables. About 24 Wilfley tables have been installed and it is estimated that they will do the work done by 60 jigs and 12 double-decked slime-tables.

Tamarack.—Twelve car-loads of structural iron, to be used in No. 5 shaft and rock-house, have arrived. The contract was let to the Wisconsin Bridge and Iron Company, of Milwaukee.

Trimountain Mining Company.—This company has ordered from the Nordberg Manufacturing Company, of Milwaukee, one of the Nordberg 20,000,000-gal. pumps similar to that of the Arcadian and Isle Royale mills and 2 heads for its mill, together with the necessary power plant and other machinery for the mill. Work is now in progress on the mill site, where clearing is being done and test pitting has commenced for to determine the character of the ground for foundations for the mill and the heads.

Copper—Keweenaw County.

(From Our Special Correspondent.)

Mohawk.—The old railroad purchased of Chas. Hebard, of Pequaming, has been repaired and the grading for an extension to the mill-site on Lake Superior completed. Rails have been laid for 9 miles; the remaining 6½ miles will be laid in the spring, snow and cold weather not permitting now.

Copper—Ontonagon County.

(From Our Special Correspondent.)

Champion.—The branch of the Copper Range Railroad from the Atlantic to this and the Trimountain mines is completed.

Iron—Menominee Range.

The superintendent of the Lake Angeline Mine at Ishpeming has, it is said, been looking over lands on this range, an option on which has been secured by the company. They consist of about 50 40-acre tracts. A crew of men will be put at work.

Loretto.—At this mine a new engine of 240 H. P. and 2 boilers of 200 H. P. each have been installed. A new machine shop, 54 by 24 ft., and a blacksmith shop, 50 by 24 ft., are being erected, and will be equipped with the latest machinery. The main shaft is being sunk from the 4th to the 5th level, a total depth of 175 ft.

MINNESOTA.

(From Our Special Correspondent.)

The improvements being made by the Carnegie Company at Conneaut Harbor, O., are designed largely for increased receipts of Minnesota ore. The company proposes to mine in Minnesota next year about 2,500,000 tons, or at least 600,000 tons more than this season. The company's Mesabi Range properties have not been panning out as was hoped, and shipments of good Bessemer from them are not so frequent as formerly. The company is provided with excellent undeveloped properties on the range, however, as well as with fine Vermilion hard ores, and will probably somewhat shift the scenes of its operations. The Stevens is to be opened, and a branch of the Duluth, Missabe & Northern is now being built there.

The case of the State of Minnesota against the iron ore carrying roads is now on at St. Paul. Owing to the serious illness of F. B. Kellogg, attorney for the Duluth & Iron Range road, it was supposed an extension of the case would be granted, but the State commission singled out the Duluth, Missabe & Northern as defendants and is proceeding. The commission evidently is determined to announce a reduction of rates before January 1st, when its term ends, even though the taking of testimony is not completed then and no time is left for a judicial consideration of the arguments. While Attorney G. W. Murray, of New York, was arguing a point one day the commission told him, in language more forceful than polite, to "go on or quit, and not take up so much time." In the hearing it has so far come out that 95% to 96% of the Missabe road's business is ore, and that of the 142,463 loaded ore cars hauled, all but

1,968 returned up the line empty. The cost of construction has been shown, as well as that of the Duluth & Iron Range. The Eastern Minnesota is made to appear, though its ore traffic is interstate business, originating in Minnesota and ending in Wisconsin, and the commission has no power over it.

D. H. Bacon, president of the Minnesota Iron Company, has sold to 2 sub-companies of the Minnesota, the Owasco Iron Company and Oneida Iron Company, lands in T. 58, R. 19; T. 58, R. 18, and T. 59, R. 17 for \$128,000, and lands in T. 58, R. 17, and T. 59, R. 19, for \$28,000. These are largely lands bought by the Minnesota company during the year from the C. N. Nelson Lumber Company for \$1,000,000, and some are known to contain ore.

Several vessels of the Minnesota Company's fleet are still loading at Two Harbors, but shipments for the year are ended. The total from these docks and over the Duluth & Iron Range road is between 4,000,000 and 4,100,000 tons, about 100,000 tons more than a year ago. The shipment of the Duluth docks of the Duluth, Missabe & Northern is 350,000 tons above the preceding year, and that of the Eastern Minnesota is 630,000 more.

The Duluth & Iron Range has now reconstructed all its ore docks but No. 4 and No. 5, built about 5 or 6 years ago. These have become obsolete on account of the rapid growth of ships and will this winter be raised, one 9 ft. and the other 6, making them 60 ft. above high water. These docks are each about 1,200 ft. long and 50 ft. wide, and the task of raising them will be considerable. The company has drawn plans for improving the easterly half of its harbor room at Two Harbors, and will ask the Government to appropriate \$400,000 for a suitable breakwater 2,200 ft. long, running to 60 ft. of water, and enclosing room enough for 5 ore docks, 2 lumber docks and merchandise and coal docks. The improvement proposed by the company as soon as the breakwater is completed call for the expenditure of about \$3,000,000, and will give facilities for handling twice the tonnage now moved.

Iron—Mesabi Range.

(From Our Special Correspondent.)

Adams exploration in 25, 58-17, will be opened as a mine next year in all probability.

Chisholm Mining Company.—This company will put in machinery at its new mine adjoining the Clark and will probably open the property this winter. There has been talk of a sale, but some of the owners do not care to sell. They have some 5,000,000 tons of ore shown, nearly half of which is a desirable Bessemer. The property is an underground proposition.

Duluth.—This company's buildings that were destroyed by a cyclone in October have been rebuilt and the mine will commence stockpiling at once. It will mine from 60,000 to 80,000 tons during the winter.

Mesaba Central Company.—This company's lands in Section 14, T. 58, R. 19, have been found to contain ore by a party sinking pits and exploring with drills there.

Sharon Ore Company.—This company has now stripped a space about 350 ft. square to a depth of 22 ft., and will continue to the ore, which is under 50 ft. of surface. A shaft will be sunk beside the pit and the milling system of mining will be employed. The mine contains a large deposit of desirable ore. Its fee is in the Sharon Company, which is affiliated with the Sharon Steel Company. It will ship over the Eastern Minnesota. A village is being built up at the mine, called Buhl.

Stevenson.—This mine will be stripped during the entire winter, if the frost is not too deep. It is hoped to have a large area open for shovel mining another year. There is a surface of about 25 ft. and the ore has been reached at several points by the stripping. The Stevenson lies upon a hillside and is finely located. It has a large and excellent ore deposit and is owned in fee by the West Missabe Land Company, J. J. Hill, and it ships over the Eastern Minnesota. The royalty is but 12½¢. if a large output is made. It is one of the tracts of land originally owned by the lumbermen who also owned the Mahoning deposit.

MISSOURI.

Jasper County.

(From Our Special Correspondent.)

Joplin Ore Market.—There was an active demand for both lead and zinc ore and the shipments were the largest for weeks. The smelters who have been run short of high-grade ore were forced to advance the price from 50c. to \$1 per ton. The best price paid at the bins was \$29 per ton. The Eagle Mine at Belleville sold 43 tons at this figure and the Marion on the land of the Continental Zinc Company at Joplin 60 tons. The Old Colony Zinc and Smelting Company at Neck City sold its output at \$29.25 delivered, equivalent to \$28.50 at the bins and, the Three Friends at Belleville sold at \$29 per ton on a dry basis. There was no change

in lead, which sold all the week at \$23 per 1,000 lbs. The four Joplin railroads were able to furnish more cars than for weeks past and the buyers loaded every car they could get. Following is the output by camps of the Joplin District for the week ending December 8th:

	Zinc lbs.	Lead lbs.	Value.
Joplin	2,396,090	470,060	\$44,256
Galena-Empire	1,811,140	194,230	27,106
Carterville	1,927,210	429,630	34,934
Webb City	361,700	42,160	5,671
Belleville	513,770	5,970	7,330
Roaring Springs	238,510	6,820	3,137
Central City	300,410	22,210	4,286
Cave Springs	270,840	8,690	3,855
Carl Junction	220,140	.....	2,361
Oronogo	563,000	10,740	7,841
Aurora	855,210	17,070	10,768
Spring City	84,320	26,450	1,620
Spurgeon	64,700	59,400	1,964
Carthage	54,880	.....	741
Seneca	71,930	7,330	674
Duenweg	98,910	55,150	2,356
Neck City	122,290	.....	1,775
Granby	359,000	17,000	3,700
Alba	127,580	.....	1,722
Springfield	88,000	.....	1,232
Ash Grove .....	.....	23,560	520
District total	10,529,640	1,396,470	\$168,324
Total 49 weeks	453,212,890	55,014,800	\$7,552,232

During the corresponding week last year top-grade zinc ore sold at \$34 per ton and lead at \$27 per 1,000 lbs. The lead sales were less than last week by 312,470 lbs., the zinc sales greater by 2,221,160 lbs., and the value greater by \$50,767. For the corresponding 49 weeks last year the lead sales were less by 9,399,950 lbs., the zinc sales greater by 26,322,090 lbs. and the value greater by \$2,771,089. As compared with the previous week, the sales show an increase of 1,733,410 lbs. of zinc, 20,160 lbs. of lead and of \$25,748 in value.

Mining Land Sales.—The 6-acre lease of Kate Thorn on the Leonard land in Chitwood Hollow, west of Joplin, has been sold to Homer P. Sewall, of Mansfield, O.; George B. Devoe and Washington Hyde, of Warren, O., for \$8,000. A mill will be erected. The Collins Mine on the Missouri Zinc Fields at Carterville has been sold to J. V. Newkirk, of Cleveland, O., for \$9,000. This is a nice little property.

Col. James O'Neill, of Webb City, is developing 1,720 acres of land which he owns at Waco and has 7 prospect shafts going down over drill holes in which a large body of high-grade zinc ore was developed. He has installed new machinery, including a large compressor and 4 air drills to break the ground in sinking.

Lyon & Leddy Company.—This company has applied for a franchise to pipe natural gas to Joplin from Oswego, Kan., about 20 miles. They have 2 wells at Oswego and are drilling a large tract of gas land at that point.

Mastodon Lease.—A strike of what is called the richest ore ever found in the district, is reported on this ground, which is the property of A. O. Nichols & Company, of Joplin. The mine was named on account of the discovery of mastodon bones in sinking. Some of the dirt taken out is said to run 52% ore, the ore assaying 67.2%. The lease is a short distance from Lehigh.

Nellie Mae Mining Company.—This company has a new 100-ton mill nearly completed on its lease at Galena and will soon be running the ore from 2 shafts.

United Zinc Company's Lease.—A pumping station has been contracted for in Chitwood Hollow, near Joplin, and work has started. Five thousand feet of 4-in. water mains will be laid from the ground of the company to Turkey Creek, a battery of boilers and a powerful Worthington pump will be put in and water forced into 5 mills for dressing ore and for fire protection. Water will also be furnished all the sub-lessees on the ground at much less rates than the city water company charges. The operators in the combine are the United Zinc Company (2 mills), the Great Scott Mining Company, Diamond Jack Mining Company, Lackawanna Mining Company and the Bessie Mining Company. Two-inch mains will be run to all the mills.

Walker Mining Company.—This company, on the Windsor ground, has started its new mill and will run the dirt from 2 shafts over it. The principal stockholders are J. L. Walker and R. Robertson and H. E. McKinney, of Kansas City, the latter being general manager.

World-Herald Lease.—In the mine of this company at Aurora last week 3 men were killed by a fall of rock and one man crippled for life. There were 13 men below ground and all had a narrow escape.

MONTANA.

Missouri River Power Company.—Pending the enlargement of the power plant at Canyon Ferry, by the addition of water wheels and generators to produce 3,000 additional electrical horsepower, a large force of men is employed in building the new double-pole line of 70 miles to Butte. According to H. Gerry, chief engineer and superintendent, the company is making large additions to the power house and is to

put in dynamos similar to those already in place. It will take about 5 months to build the line before the machinery is ready and work will continue as long as the weather permits. The line will go by way of Boulder, and a substation will be built in Butte. When completed, it will be the longest transmission of power in the west, and one of the longest and largest in the world. The present plant has been operating for about 2 years.

Madison County.

Revenue Mill.—Alexander Livingston has leased this mill at Jardine for 3 months from E. B. Weirick, cashier of the First National Bank at Butte. He also has an option on the plant for \$50,000. About 25 men will be put to work at once, and this number will be rapidly increased until operations reach the same proportions as before the mill was shut down. The mill is being put in trim by D. A. Buchanan, of Tacoma. The ore will be taken from the Robinson Claim, under the superintendency of James Hall, of Cooke City.

Silver Bow County.

Anaconda Mining Company.—Wm. Scallon, the new president of the company, who just returned to Butte from New York, has, according to a recent dispatch, issued orders for a temporary shutdown of the Bell and Montana Consolidated mines, 2 of the company's large properties; 1,000 men are thrown out of employment. One reason given is shortage of water; another, overproduction of ore and inability of smelters to handle it. It is reported that real cause is political and a warning to threatened 8-hour legislation by the State Legislature, which meets in January. It is possible that the fire in the Bell shaft may be partly responsible.

Judge Knowles on December 10th granted a new trial in the mining suit of E. Rollins Morse against the Montana Ore Purchasing Company, which was tried in the United States Court in Helena last winter. The action involved the Michael Davitt claim in Butte owned by the Boston & Montana Mining Company. The jury unanimously decided the case in favor of the Montana Ore Purchasing Company, of which F. Augustus Heinze is president. A petition was subsequently filed by the plaintiff for a new trial, and it was this petition which was decided. The Montana Ore Purchasing Company claimed the right to certain veins on the ground that the veins apexed in the Pennsylvania and Johnston claims, both of which it owned.

Judge Knowles set aside the verdict on the ground that the jury was unduly influenced by certain newspaper articles and not on the ground that the evidence did not warrant the verdict. There is no appeal from the decision.

Montana Ore Purchasing Company.—This company, it is stated, will soon increase its reduction plant so that it will be able to produce 3,000,000 lbs. of copper monthly. Two new blast furnaces and 4 converters have been ordered. The company is now securing its ore from the Rarus, Nipper, Minnie Healey, Clinton and Homestake mines. Considerable ore is also coming from the Glengarry lessees. The company is sinking a new shaft on the Balm lode claim which lies north of the Gagnon Mine. A shaft is also being sunk by the same company on the Cora. The Clinton and Homestake mines are on the continental divide east of Butte.

NORTH CAROLINA.

Montgomery County.

(From Our Special Correspondent.)

Sam Christian.—This gold mine is producing some fine nuggets and dust gold, as the result of prospecting done by Richard Eames.

OHIO.

Perry County.

(From Our Special Correspondent.)

Franklin Fuel Company.—This company is making a new opening into its mine No. 12 and building a new tippie. The tippie will have 2 dumps and will be connected with the slope by a chain hoist. The plant will be capable of handling 1,200 tons or more daily. C. F. Evans is president, of Columbus, O.; T. E. Underwood is superintendent, of Corning, O.; Prof. F. A. Ray is consulting engineer, of Columbus, O.

OREGON.

Josephine County.

Smith & Stensel, of Footh Creek, have completed their 1-mile ditch and reservoir. They have several claims and a 275-ft. fall. This property was bought nearly a year ago. They use 11-in. pipe.

Wolf Creek Placers.—H. C. McIntosh has sold his placer properties on Wolf Creek and Coyote Creek comprising 224 acres, or 11 claims, to G. B. Perelli and Wolff & Zwicker, of Portland. The Wolf Creek placer comprises 160 acres of land, with 2 water rights and 2 ditches running 800 in. of water. The ditches are 4 miles long and have a pressure of 150 and 190 ft. The claims consist of a gravel channel, with banks 12 to 30 ft. high. The property has been worked for 30 or 40 years, and has paid from \$1,000 to \$3,000 a year. A grizzly is used.

The Coyote Creek is the Jason Placers, a bench claim of 84 acres. The only water right is from the gulches, which sometimes enables it to be worked from 1 to 1½ months. There is no rock to speak of, principally red dirt with banks 14 to 50 ft. The ground is rich and has paid \$1,000 to \$2,000 in a season's run. It carries coarse gold.

PENNSYLVANIA.

Bituminous Coal.

(From Our Special Correspondent.)

A syndicate composed of Rev. Campbell Jones, of Waynesburg, T. F. Kelly, of Uniontown, Hillman & Sons, of Pittsburg, and John S. Danley, has purchased the coal under 11,000 acres of coal land in Washington County on the Baltimore & Ohio Railroad near Clayville. The price paid was \$20 an acre.

Isabella Coal and Coke Company.—About 5 acres of land over the mine of this company on the Robert Gilson farm near Blairsville caved in recently.

SOUTH DAKOTA.

Custer County.

(From Our Special Correspondent.)

Chicago Mica Company.—This company has purchased the Daly mica mine, which will be opened immediately.

Lawrence County.

(From Our Special Correspondent.)

Cora.—A. H. Oleson, of Deadwood, acting for Denver parties, has purchased this mine at Galena. The old Davy stamp mill has been leased and will handle the ore as soon as repairs can be made. The Cora has been a producer.

Homestake Company.—One hundred more miners have been set to work and 200 mill and hoist men. Every stamp at the 4 mills is dropping, the first time in 3 years. The company will employ about 2,200 men. Those at work on the ditch will be given work in the mines and mills. Everything about the pumping station and ditch is satisfactory. The company's surveyors have completed surveying a site for a second cyanide plant on the Central City side of Lead Hill. Work will begin on the foundation as soon as the first plant is completed.

North Lead District.—Otto P. Th. Grantz has returned from Colorado, where he went with 2 car-loads of ore from the Hidden Fortune Mine. He states that a Chicago party has bonded practically several groups of claims in the North Lead District, including the Hidden Fortune Mine, and that a deal is practically closed. He confirms the sale of the Dakota Maid Mine, in the Little Strawberry Gulch District. He states that work on the deep shaft on the Kirk ground south of the Homestake will start January 1st.

Population of Black Hills.—The recent census of the Black Hills gives a total of 37,590. Three of the 6 counties have gained and 3 have lost in population.

Spearfish Mining Company.—Final payment has been made on the Hermitage group of claims by this company. The company's ground at Ragged Top has cost about \$35,000 and the new 200-ton cyanide plant will cost about \$30,000. The company expects to expend about \$75,000. It has started up its new cyanide plant at Ragged Top. The ore is received at the top of the mill, 175 ft. below the lower floor. It falls into a 16 by 22 Blake crusher. After leaving the crusher the ore is screened and goes to 10 solution tanks, each with a capacity of 120 tons. The time of extraction is 4 to 6 days. The plant has total capacity of 250 tons and 10 men handle all the ore.

WASHINGTON.

Ferry County—Republic.

(From Our Special Correspondent.)

Republic Consolidated Gold Mining Company.—Mr. Ayers, the treasurer, submitted a report at the annual meeting at Spokane, from the vice-president, Robert Jaffray, of Toronto, Ont., covering a period from April 1st, 1899, to September 1st, 1900. Since the 1st of September \$180,000 of the assets have been disposed of, thus reducing the liability to \$120,000. "For 8 months the little mill, which had been erected before we obtained possession, continued in operation and produced \$230,000 of gold. The operating proved so expensive, and the extraction of gold ran so low, that it was deemed prudent to dismantle it and erect an entirely new plant. This mill has been erected and the process has proved an entire success. Its capacity will be increased to 200 and possibly 300 tons per day. The mill has been handed over to the Republic Power and Cyaniding Company."

At present the company is running the mill only on ore from the Republic Mine, but after January 1st it will treat custom ore, and later may increase the capacity of the mill. It is said not a single return had been received from the mill which gives less than 90% extraction, and Manager R. G. E. Leckie states that the extraction has reached 93%. The ball pulverizers grind too slowly to take the ore from the

rolls; they will therefore be replaced. Some time during the winter a working shaft will be sunk from the surface below the present working depths. It is intended to keep development work in the mine one or two years ahead of the stopes.

WEST VIRGINIA.

Fayette County.

(From Our Special Correspondent.)

It is stated on good authority that the Raven Coal and Coke Company, operating on Blake's Branch, are negotiating for the sale of their plant to the Carbon Coal and Coke Company, operating the adjacent lease at the mouth of the Branch.

Preston County.

(From Our Special Correspondent.)

The C. C. Craig and James A. Brown farms, near Kingwood, have been purchased by W. P. Hurst, of Scottsdale. This just includes the 2 lower veins of coal, upper Freeport and Kittanning. The farms adjoin each other, and sold for \$12 per acre. Hurst will build works at once on the Craig farm from which all the coal can be mined. The 2 sales amounted to about \$5,400.

Ohio County.

(From Our Special Correspondent.)

A deal was recently completed between J. V. Thompson, of Uniontown, and farmers of this county, for 7,000 acres of coal land. The price paid was \$160,000.

Petroleum.

Another mammoth oil gusher is reported drilled-in in the Copley Oil District, West Virginia. It is situated on the James Mullady farm, 2,600 ft. east of the original Copley Farm gusher. It was drilled-in late on December 7th, and in the first 24 hours produced 7,200 bbls. of crude oil, a flow at the rate of 300 bbls. per hour. This exceeds the output of the original Copley Farm gusher which began to flow at the rate of 250 bbls. per hour, but is now down to 75 bbls. per hour. This is the third gusher in this district within 3 months.

WYOMING.

Carbon County.

(From Our Special Correspondent.)

East Side Copper Belt.—The copper belt on the east side of the North Platte Valley and on the west slope of the Medicine Bow Range is just beginning to assume prominence. In the scramble for locations in the Sierra Madre range on the west side this section has been overlooked by prospectors. With the exception of one case, that of the Dewey Mine, no prospecting has been done on the east side except by ranchmen, until recently. Toward the south end of this belt between Mullin and Douglass Creeks several large veins of copper have been opened at different points. These veins are low-grade, but are promising on account of their great size. The principal group on one of the largest veins is owned by the Adams Brothers, the Woods Brothers and James Farrel. Locations on 2 other veins of higher grade ore toward the head of Mullin Creek are owned by Sherman Lute and father.

FOREIGN MINING NEWS.

AUSTRALASIA.

New South Wales.

The exports from the Colony for the nine months ending September 30th are reported as follows: Silver, in bars and base bullion, 574,323 oz.; lead and lead ores, 320,151 tons; copper and copper matte, 6,157 tons; tin, 389 tons; coal, 2,453,688 tons. The total value of these exports was £3,274,918, showing an increase of £560,233, or 20.6%, over last year.

The gold produced for the nine months is reported at 263,710 oz. crude, equal to 214,879 oz. fine gold, or \$4,441,553.

Queensland.

The Mines Department reports for October that the total gold production was 69,830 oz. crude, which compares with 82,936 oz. in 1899, showing a decrease of 13,106 oz., or 15.8%. The output this year was equal to 50,551 oz. fine gold, or \$1,044,889.

Victoria.

The production of gold in Victoria for the month of September, according to the returns supplied by the Mines Department, amounted to 69,989 oz., bringing the total for 9 months up to 580,083 oz., as against 616,576 oz. for the corresponding period of 1899. The dividends paid by public companies for the 9 months last past total £340,119.

CANADA.

The Pacific Coal Company, Limited, has been organized to carry on the business of coal mining in the Canadian Northwest. The promoters are Montreal and Toronto gentlemen, and the provisional directors are Sir W. C. Van Horne, Messrs. R. B. Angus, C. R. Hosmer, E. B. Osler, M.P., and W. D. Matthews. The capital of

the company will be \$4,000,000; divided in 80,000 shares at \$50 each. The chief place of business will be Montreal.

British Columbia—Boundary District.
(From Our Special Correspondent.)

Boundary Ore Shipments.—About 23,000 tons of ore were sent to smelters from Boundary District mines during November as follows: Old Ironsides & Knob Hill group, 18,000 tons; B. C., 2,500 tons; Mother Lode, 2,000 tons; sundry small shipments, 500 tons; total, 23,000 tons.

British Columbia Copper.—This company's smelter at Greenwood is nearing completion, but the non-arrival of a part of the plant is causing delay. An effort is being made to have everything in readiness for commencing operations by the end of January.

Construction work is also being pushed at the Standard Company's pyritic smelter, near Greenwood, the plant and machinery for which are now arriving.

Brooklyn & Stenwinder Group.—James Breen, who some time since sold out his interest in the Northport Smelter, having now acquired a considerable holding of stock in the Dominion Copper Company, of Toronto, Ont., is arranging to resume development work on the company's properties at Phoenix. From 20 to 30 men will be at work soon. The Brooklyn has a 268-ft. shaft and about 900 ft. of crosscutting and drifting at the 150-ft. level, and 800 ft. at the 250 level. A fine body of copper ore has been exposed in these workings. A smelter test of 6 car-loads gave gross values (at New York prices) of \$10.40 per ton. The Stenwinder, which adjoins the Brooklyn, has an incline shaft 344 ft. deep, with 165 ft. of crosscuts and drifts at the 115-ft. level. These properties are among the most promising in Greenwood camp.

Granby.—This company's smelter at Grand Forks continues to put through its 2 furnaces rather more than 600 tons of ore daily.

Mother Lode.—The largest hoisting engine yet sent into the Boundary District has just been received at this British Columbia Copper Company's mine, near Greenwood. It was manufactured by the Jenckes Machine Company, of Sherbrooke, Quebec, and will be installed without delay. Good progress is being made with the installation of the 35-drill Ingersoll-Sergeant air-compressor. Stopes are looking well at both the 200 and 300 levels and the output of ore is steadily maintained.

British Columbia—West Kootenay District.
(From Our Special Correspondent.)

Rossland Ore Shipments.—The shipments from Rossland mines for the 11 months ending November 30th amounted to 204,000 tons, valued at \$3,200,000 gross, compared with 155,000 tons valued at \$2,635,000 gross for the corresponding period of 1899.

St. Eugene Consolidated Mining Company.—The management has contracted with Guggenheim & Sons, of Antofagasta, Chile, for \$1,000,000 worth of reduced argentiferous lead ores per year from the Moyie mines.

For the three months ending November 30th, \$150,000 worth of these ores have been shipped via the Canadian Pacific Railway to Vancouver, and by steamship to San Francisco, where it is transferred to other steamships for Chile. The management of the St. Eugene is now shipping another \$150,000 lot to the same destination.

Ontario—Hastings County.
(From Our Special Correspondent.)

Canadian Gold Fields.—This company, at Deloro, has added 10 stamps to its mill, making 20 stamps, doubled the size of the arsenic plant, and is putting in an electric light and erecting buildings. The improvements will cost \$50,000.

Cordova.—This company is doing well with its property 10 miles northwest of Marmora. It has pulled down the old 10-stamp mill and has a 30-stamp mill nearly completed.

Sophia.—This property in Madoc Township, near Queensboro, was formerly called the Stewart and was owned by P. McLaren, of Perth. It is now running full time, a 10-stamp mill having been erected last summer. The ore is low-grade, though it contains some rich shoots and is said to pay well.

The outlook for mining properties about Deloro and Marmora is excellent; in fact, has never been better. Every mill in operation is reported to be paying and several properties have changed hands recently.

Ontario—Rainy River District.
(From Our Special Correspondent.)

Anglo-Canadian Gold Estates, Limited.—This English company has obtained from the Bureau of Mines at Toronto the exclusive right for 3 years from January 1st, 1901, to prospect for minerals or conduct mining operations on 5 tracts of land, between Crow Lake—east of Lake of the Woods—and the Seine River, the total area being about 117 square miles. The lessees have to expend a certain sum each year in prospecting and development work, amounting for the 3 years to \$120,000. Any lands which the com-

pany desire to appropriate must be paid for at the ordinary rates.

Platinum.—A small island in the Lake of the Woods, about 12 miles from Rat Portage, is traversed by a strong quartz lode in hornblende schist. Besides carrying gold and silver, this vein is said to show a notable percentage of platinum. An assay made in the laboratory of the School of Practical Science indicated a value of 1.15 oz. per ton in platinum.

CENTRAL AMERICA.
Nicaragua.

(From an Occasional Correspondent.)

Messrs. Allen & Fulks have sold an interest in some of their El Mico properties to Brown & Harris, of Bluefields and Rama, and Mr. C. A. Abbott is now erecting for them on the Topaz Mine one of Fraser & Chalmers' 20-stamp mills.

COAL TRADE REVIEW.

New York.
Anthracite.

Dec. 14.

Lake navigation has closed, thus cutting off one territory that has been calling for hard coal; the collieries turned out 4,971,576 tons last month and yet the demand still exceeds the supply. It is a good strong demand and sales agents at New York and other Eastern points are having a lot of trouble from insistent buyers. The demand seems to come from all points where coal is usually shipped at this season, and shows no signs of letting up for some time. New York jobbers and sales agents say it is harder to get coal for immediate delivery than in 20 years. No large company is apparently in a position to get coal forward within 2 weeks of receipt of order.

In the West the supply of coal in Lake Superior territory, while not as large as at this time last year, is probably better than it seems, as a lot of coal was stored away during the early days of the strike. In Chicago territory lake receipts are nearly 500,000 tons below last season's figures. Retail demand has not been very heavy of late on account of the weather, but evidently a lot of rail coal is to go forward this winter. At Buffalo retail buying has been stimulated by the cold wave. The last cargoes up the lakes secured a \$1 freight rate. In the East buyers at Boston are clamoring for coal as loudly as ever and getting but little more comfort. Philadelphia is about as badly off as New York.

Everything indicates that the Pennsylvania Coal Company is to be controlled by the larger companies shipping from the Wyoming region, or, at least, will act in harmony with them. With the projected Wyoming Valley & Kingston Railroad killed off and the New York, Wyoming & Western but a distant memory, one is tempted to wonder what will become of the Anthracite Operators' Association. Perhaps it will now take up the matter of shipping coal to Europe more actively and go to work to secure that line of colliers of which the public has heard from time to time.

Prices for all sizes of coal are well maintained. We quote for free-burning anthracite f. o. b. New York Harbor ports: Broken, \$4; egg, \$4.25; stove and nut, \$4.50; pea, \$3; buckwheat, \$2.25 @ \$2.50.

Bituminous.

The Atlantic seaboard soft coal trade is easier. All producers are shipping the last lots of coal to the shoal-water ports, and with these finally cleared up the market will be still quieter. There is bound to be a good active demand for the high-grade coals for some time yet, but the lower grades will be in abundant supply. There is but little news this week. Nothing is heard of quotations on next year's business, probably because the low prices that have been named are offset by the 10c. increase in freight rates to tidewater.

In the far East the market is now quite easy. Most consumers have ordered all the coal they want for the winter. There is still enough going forward on this season's old contracts, however, to keep things fairly busy. Along Long Island Sound the demand continues very heavy, although this demand is in proportion to the grade, as consumers are disposed to be critical and want the best. Producers of the higher grades are yet unable to supply all demands from this territory. New York harbor trade is active. All-rail demand is large, in fact larger than it has been of late. But little is heard nowadays of foreign trade. Shipments are still going abroad, but the movement is not heavy and is dwindling.

Transportation from mines to tide is slower than it was. Car supply has improved and now runs up to from 80% to 95% of the whole number wanted.

In the coastwise vessel market vessels are making long trips and are in short supply at the lower loading ports. New York Harbor ports are attracting some vessels, as rates are higher from them than from below. We quote current rates from Philadelphia as follows: Providence,

New Bedford and the Sound, 65c.; Boston, Portland and Salem, 70c.; Portsmouth, 75c.; Lynn and Newburyport, 85c.; Wareham, \$1.

Birmingham, Ala. Dec. 10.

(From Our Special Correspondent.)

There has been no change in the conditions of the Alabama coal market and the mines are working steadily. Another coal producing company will soon be in the market with its product; the railroad to the Stout Mountain Coal and Coke Company's property is to be completed within another week, when traffic will be supplied by that concern.

The United Mine Workers in Alabama will this week select their officers for the ensuing year. As the officers are leaders when the wage scale is signed in July, the meeting is quite an important affair.

Chicago. Dec. 11.

(From Our Special Correspondent.)

Anthracite coal is in very short supply and shippers are unable to furnish anywhere near the amount of coal wanted. The weather having turned cold, an extra demand has been occasioned. Prices are strictly maintained, circular being \$6 f. o. b. Chicago on all sizes.

Bituminous coal has had a better demand, due to increased buying of office buildings, manufacturers, etc., because of colder weather. The supply of soft coal is very large at present, in fact so large that prices are demoralized, and from the present outlook a big business will have to come quickly or prices will go to smash. The supply of the better grades from West Virginia and Kentucky is larger, but such is the demand for these coals that most of it is absorbed as soon as it reaches this market.

Cleveland, O. Dec. 12.

(From Our Special Correspondent.)

The virtual close of the season of navigation has put a stop to the movement of coal by the water routes for the winter. The reports are not yet in of the amount of coal that has been sent from Lake Erie ports to the Northwest during the season, but estimates have been made which indicate that the movement will be almost 1,000,000 tons heavier than any year in the history of the lakes. The average freights for the year will be about 50c., the figure at which Duluth contracts were made. The end of the lake season has allowed the railroads more cars with which to move commercial coal in this territory, but as the dispatch here is not so great as in the lake shipment the relief is not perceptible. The movement of this commercial coal is extremely heavy and more would be shipped had the railroads the facilities for doing it. Some of the mines find that their production is far past the ability of the roads to get it away. No sales are made on contracts for next year's delivery to the upper lakes, but it is expected that a meeting will be held in a short time at which these prices will be discussed and, it may be, decided upon.

San Francisco. Dec. 8.

(From Our Special Correspondent.)

Coal receipts at San Francisco by water in November were 123,586 tons. For the 11 months ending November 30th the receipts were as follows, in short tons:

	Tons.
Eastern, anthracite and Cumb.....	14,272
Oregon	34,450
Washington	588,533
Total domestic.....	637,255
British Columbia.....	548,709
Australia.....	159,478
Japan.....	6,100
Great Britain.....	70,964
Total imported.....	1,284,551
Total.....	1,921,806

The receipts do not include coal coming from California mines, or from Rocky Mountain mines by rail. The total increase shown this year was 105,579 tons, or 8%. The gain was entirely in British Columbia coal.

Pittsburg, Pa. Dec. 12.

(From Our Special Correspondent.)

Coal.—The last shipment of coal to the Southern markets for the present was made yesterday. Despite the strike of the river engineers, the Monongahela River Consolidated Company was able to send out fully 20,000,000 bush. of the 30,000,000 bush. loaded. The shipments this week was all boat coal destined for the New Orleans market. A coal boat contains 25,000 bush. and barges that are used for the Cincinnati and Louisville trade hold but 12,000 bush. The lighter craft were the first to get away. The returning towboats brought back enough empties to keep the river miners busy for several months and there was a general resumption of operations at the river mines on Monday. Fully 10,000 diggers are now employed, the majority of whom have been idle since June. All the mines of the Pittsburg Coal Company are in operation, supplying local trade. The officials of the combination this week made a denial of the frequent reports circulated that it is accepting

contracts for export trade. Prices remain unchanged.

Connellsville Coke.—There was a slight falling off in both production and shipments of Connellsville coke last week. The prices are unchanged, and there will not be any change this year. Furnace coke is quoted at \$2 and foundry at \$2.25@2.50. The production last week was 155,050 tons, a loss of 696 tons compared with the previous week. The shipments for the week aggregated 8,047 cars, distributed as follows: To Pittsburg and river tipples, 2,976 cars; to points west of Pittsburg, 3,709 cars; to points east of Connellsville, 1,362 cars. This shows a decrease of 332 cars.

Foreign Coal Trade.

Inquiry for coal for export continues, though of a somewhat less pressing nature. No new contracts of importance can be noted. Freight rates are a little easier.

In France the demand for metallurgical fuel is reported as lighter. For household fuel prices are still very high and there is much consequent complaint.

In the German trade there is little or nothing new. The coal syndicates are generally refusing to make any concessions on prices, or to guarantee any better deliveries for the new year.

Messrs. Hull, Blyth & Co., of London and Cardiff, report under date of December 1st that the supply of coal is in excess of the demand and prices are weaker. The quotations are: Best Welsh steam, \$4.44@4.56; seconds, \$4.20; third, \$4.02; dry coals, \$3.96@4.20; best Monmouthshire semi-bituminous, \$4.08@4.32; seconds, \$3.72@3.96; best small steam coal, \$2.28@2.52; seconds, \$2.04@2.28; other sorts, \$1.62.

These prices for Cardiff coals are f. o. b. Cardiff, Penarth or Barry, while those for Monmouthshire coals are all f. o. b. Newport, exclusive of wharfage, and are for cash in 30 days, less 2½% discount.

Freight rates have shown a slight weakening tendency, owing to the anxiety of owners to get their steamers fixed before the approaching holidays. Some rates quoted are: Cardiff to Marseilles, \$2.30; Genoa, \$2.28; Naples, \$2.34; Las Palmas, \$1.86; St. Vincent, \$1.98; Buenos Aires, \$3.24; Rio Janeiro, \$3.72.

SLATE TRADE REVIEW.

New York. Dec. 14.

The list of prices per square for No. 1 slate standard brand f. o. b. at quarries in car-load lots, is given below:

Size, inches	Monson or Br'n. ville.		Bangor.		Bangor Ribbon.		Alb'n. or Jackson Bangor.		Chap'n. Key's ne		Peach Bottom.		Sea Gr'n.		Unfad'g Green.		Red.	
	\$	¢	\$	¢	\$	¢	\$	¢	\$	¢	\$	¢	\$	¢	\$	¢	\$	¢
24 x 14	6.50		3.50	3.00	3.00		3.00		3.80	5.10	2.90							
24 x 12	6.60		3.50	3.00	3.00		3.00		3.80	5.25	2.90							
22 x 12	6.60		3.50	3.25	3.00		3.00		4.05	5.25	2.90	3.75						
22 x 11	6.50		3.75	3.25	3.00		3.00		4.05	5.25	2.90	4.00						
20 x 12	6.90		3.75		3.00		3.00		4.05	5.25	2.90	3.75						
20 x 11	6.90		3.75		3.25		3.00		4.05	5.25	2.90							
20 x 10	6.80		4.25	3.50	3.25		3.00		4.00	5.35	2.90	4.25	16.50					
18 x 12	6.80		3.75		3.00		3.00		4.00	5.25	2.90	3.50						
18 x 11	7.00								4.00	5.25	2.90	3.75						
18 x 10	7.00		4.25	3.50	3.25		3.00		4.00	5.35	2.90	4.00	10.50					
18 x 9	7.00		4.50	3.50	3.25		3.00		4.00	5.35	2.90	4.25	10.50					
16 x 12	6.80		3.75		3.00		3.00		4.00	5.25	2.85	3.50						
16 x 10	7.00		4.25	3.50	3.25		3.00		4.00	5.25	2.85	4.00	10.50					
16 x 9	7.00		4.25		3.25		3.00		4.00	5.35	2.85	4.25	10.50					
16 x 8	7.00		4.50	3.50	3.25		3.25		4.25	5.35	2.85	4.25	10.50					
14 x 10	6.60		3.75	3.25	3.00		3.00		4.00	5.25	2.70	3.75	10.50					
14 x 9	6.50								4.00	5.10	2.70	3.75	10.50					
14 x 8	6.60		3.75	3.25	3.00		3.00		4.00	5.10	2.70	4.25	10.50					
14 x 7	6.40		3.75	3.25	3.00		3.00		3.75	5.10	2.50	4.25	10.50					
12 x 10	5.75										2.50	3.25						
12 x 9	5.60										2.50	3.25						
12 x 8	5.50		3.50						4.85	2.50	3.50	9.00						
12 x 7	5.00		3.25		2.85		3.25	4.85	3.25	4.85	2.25	3.50	9.00					
12 x 6	4.80		3.25		2.85		3.25	4.75	2.25	3.50	8.50							

A square of slate is 100 sq. ft. as laid on the roof

November shipments were less than the previous month. As compared with November last year the movement of roofing slate and school slates was less, but blackboards showed some increase. The shipments from the two leading railway stations in Pennsylvania alone in November consisted of 13,972 squares roofing slate; 2,003 crates blackboards and 172 cases school slates. Manufacturers complain that they could not get the necessary supply of cars to ship their product.

New slate discoveries are heard of constantly. The latest is that reported in Alabama, about 50 miles from Birmingham. This slate is purple in color and is suitable for many purposes besides roofing. In Polk County, Arkansas, a large deposit is being worked and mill stock will be made at Mena.

Export trade is quiet.

IRON MARKET REVIEW.

NEW YORK, Dec. 14, 1900

Pig Iron Production and Furnaces in Blast.

Fuel used	Week ending				From Jan., '99.	From Jan., '00.
	Dec. 15, 1899.		Dec. 14, 1900.			
	F'ces	Tons.	F'ces	Tons.	Tons.	Tons.
An'racite & Coke.	257	333,428	176	222,525	12,712,574	12,979,892
Charcoal.	30	8,743	31	8,350	271,353	365,885
Totals..	287	342,171	207	230,875	12,983,927	13,345,777

The usual quieting down toward the close of the year begins to be manifest in the iron trade. The volume of business has been fair, but some disposition to hold back is shown. The fixing of prices by the various combinations is going on, but is rather lightly regarded by buyers. In some cases this process is regarded as leaving an excellent opening for the starting of new mills.

The New York Central has placed its orders for the year, aggregating 80,000 tons of steel rails at \$26. The rail mills claim to have 1,000,000 tons on their books. Some important Western roads are still holding back.

Export business is quiet and inquiries are said to be less numerous. This is explained by the doubtful condition of the European markets.

Notes of the Week.

The Sloss-Sheffield Steel and Iron Company reports for the quarter ending November 30th net earnings—after deducting \$27,173 for depreciation and renewals—of \$197,092. Charges were \$56,846 and dividends \$114,000, leaving a balance of \$26,246. Adding the surplus August 31st, which was \$425,189, makes a total surplus of \$451,435 on November 30th.

Birmingham, Ala. Dec. 10.

(From Our Special Correspondent.)

There is much activity to be noted in the iron market in Alabama right now. Inquiry is being made for the product of the blast furnaces and steel mills that is most encouraging and there are every indication that the demand is going to be good for some time to come. In the yards of both the American Pig Iron Storage Warrant Company and the Tennessee Company's warrant yard there are no more than 65,000 tons of pig iron in Birmingham. The Alabama Consolidated Coal and Iron Company recently moved 7,000 tons from the warrant yards. This company will shortly after the new year blow in Gadsden Furnace.

The sales during the month of November were quite satisfactory and the shipments heavy. The Tennessee Coal, Iron and Railroad Company sold during last month 111,000 tons of pig iron, but the average price thereof was only \$9.908 per ton. The average price to-day is considerably greater than that, inasmuch as all the sales now being made are at the advance of from \$1 to \$1.25 per ton. The Sloss-Sheffield Steel and Iron Company manufactured last month more than 20,000 tons of pig iron, though with only five furnaces in blast.

Recently Williamson Furnace in this city, operated by the Jones Valley Iron Company, went out of blast because of temporary embarrassment of the company; Mr. T. H. Aldrich has been appointed receiver for the concern, and it is believed that the furnace will shortly resume operation.

Preparations are being made to blow in two furnaces in the Sheffield District. Trussville Furnace and property were sold to-day to satisfy judgments and this furnace may be put in blast again also. The Dimmick pipe plant during the past week filed papers for the issue of first mortgage bonds for \$100,000, this sum to be used in enlarging the plant at North Birmingham.

The steel wire, rod and nail mill at Ensley is working hard, notwithstanding the filing of a suit against the Alabama Steel Wire and Rod Company by the American Steel and Wire Company, who ask for \$100,000 damages and also for an injunction to prevent the Alabama concern from using a patented process for the manufacturing of wire. This suit was filed in the United States Court in Birmingham during the past week.

The following quotations are given: No. 1 foundry, \$11.50@12.50; No. 2 foundry, \$10.50@11.50; No. 3 foundry, \$9.50@10.50; No. 4 foundry, \$9.50@10; gray forge, \$9.75@10; No. 1 soft, \$11.50@12.50; No. 2 soft, \$10.50@11.50.

The export trade is in good shape and a large amount of pig iron is being shipped abroad. Steel exporting on a larger scale has commenced in this district and it is stated that there are some heavy amounts to go forward.

Chicago. Dec. 11.

(From Our Special Correspondent.)

Pig Iron.—The accumulation of pig iron that has been going on for a couple of months past by consumers in all lines seems for the time being to have let up, though the past week's business represents a very fair quantity in the ag-

gregate tonnage. The buying is for smaller lots and the inquiry has fallen off. The large buyers are noticeably absent from the market. Prices are firm, but no great advance is expected. We quote: Lake Superior charcoal, \$19.50@20; local coke foundry, No. 1, \$15@15.75; No. 2, \$14.50@15.25; No. 3, \$14@14.75; local Scotch, No. 1, \$15@16.25; Ohio strong softeners, No. 1, \$16@16.50; Southern silvery, according to silicon, \$16.10@16.60; Southern coke, No. 1, \$15.35@15.85; No. 2, \$14.60@15.10; No. 3, \$14.10@14.60; Southern No. 1 soft, \$15.35@15.85; No. 2 soft, \$14.60@15.10; standard Bessemer, \$15@15.50; malleable Bessemer, \$15@15.50.

Cleveland, O. Dec. 12.

(From Our Special Correspondent.)

Iron Ore.—Iron ore men have appointed January 25th as the date when the Ore Association is to meet to fix prices for the coming year. Many guesses are made as to the probable action, but any speculation made at this time may prove to be far wide of the mark. The guess made by the best informed iron men is \$4 on Bessemer, with other prices in proportion. The shipment of ore on the lakes is about at an end for this season. A few cargoes are coming down but no charters are being made, the vessels engaging in the trade belonging to the producers. Calculations now made for next year take into account the existence of a vast supply of Canada ore that is to be shipped into the United States. The movement from the lower lake stock piles, which are congested, to the stock piles of the furnaces is very heavy at this time. The only thing which limits this is the scant supply of cars afforded by the railroads.

Pig Iron.—Sales of pig iron have been heavy this week. Buyers appear to be covering their wants for the next six months and are buying 500 to 1,000 ton lots and even in larger quantities. The sales are numerous. The market holds strong, with upward tendencies. No. 1 foundry is bringing \$14 and No. 2 is sold for \$13.50. Basic iron is sold at \$13.50 and off basic at \$12.50, the latter price being a slight advance over previous quotations. The demand for Bessemer is now heavy, an inquiry having been heard for 20,000 tons. There is some talk of resuming operations in the idle Bessemer furnaces soon.

Finisher Material.—The sales of steel rails have been heavy in this territory during the past week. The fight between the steel rail makers and the railroads appears to be at an end. The Lake Shore Railroad came in and covered for 25,000 tons at \$26 and this was followed by the Nickel Plate Railroad with an order for 5,000 tons. Other Vanderbilt interests are also said to have covered their needs, the aggregate sales being over 75,000 tons. The price of steel plate has been advanced to 1.40c., Pittsburg. It is said that this was a compromise measure in a meeting of the mill men, some demanding that the price be advanced to 1.50c. This week has seen an order of 500 tons of billets placed at \$19.75, the Association price. The product is limited, the mills still having need for all of that material they can make. The bar market is strong, with large orders appearing constantly and but a very poor prospect for early deliveries. There is a lively business in shapes, the sales being large and the market strong. The association prices of 1.50c. and 1.40c. hold firm.

Old Irons.—This week there has been a decided upward tendency in the scrap market. Buyers have been covering their needs with heavy orders and have conceded to the dealers better prices. The following quotations might be made: Machinery cast, \$13; turnings, \$9; borings, \$6.50; No. 1 wrought, \$16.

Philadelphia, Pa. Dec. 13.

(From Our Special Correspondent.)

Pig Iron.—The pig iron market is quieter than for a month. The dullness of the holiday season is on us and no important transactions are probable until the opening of the new year. The special brands of foundry are always wanted by certain large users, but all other kinds incline to weakness. Since Monday our leading brokers and furnace people have had no inquiries. The forge iron users have, with two or three known exceptions, bought as much forge iron as they feel safe in buying. Basic pig has been inquired for a good deal, but buyers hesitate to pay the asking price. There is no reason for believing that basic will go lower. There are rumors of large deals early next year. The feeling of the trade is that prices are more likely to go off. No changes since last week have been made.

Billets.—From various sources the conclusion is reached that billets will at least hold their own. Eastern customers have provided themselves for work that has been secured, but when advised by billet makers to extend their purchases far into the year they decline. The steel plate pool has had an indirect effect on billets here and the Eastern plate mills being in the combine are able to make prices which guarantees them a share of the Eastern trade.

Pipes and Tubes.—Even in the present dullness fair orders are coming along for both pipes and tubes. The individual orders are not large, but there are a good many of them. Prices are firm.

Sheets.—The demand for sheet iron during the past week was quite a surprise, even if the lots taken were small. Nearly all who use sheet iron feel that at present quotations they are safe in ordering as much as they can work up in 60 days. It is not easy to sell sheets for later delivery. There appears to be all through the iron trade a feeling of uncertainty as to the permanency of prices. So much new capacity is coming in of one kind or another that buyers feel like keeping clear of tight contracts until they can see more clearly into 1901.

Merchant Steel.—The users of merchant steel are not buying at present. Nearly all have what they need for a few weeks. The prices quoted by the new organization are high and no concessions are made except to the few who buy in a very large way.

Plates.—The new plate combination, in the opinion of a leading steel maker expressed to-day, only makes a place for new plate mills. Since the new rates were announced a good many small orders have been booked by the Eastern plants who have entered it.

Structural Material.—The structural steel makers express a very optimistic opinion to-day about prices and demand. While business has fallen off a little within the week, it makes no impression. All facilities are employed and business could not be better. Prices named are paid. There is no more dickering.

Steel Rails.—Persons who claim to know say there is not such smooth sailing in the steel rail trade as appears. On the surface everything looks right, but a great deal of business is being held back, especially by Western railroads. The prediction is made here that there will be a break from the agreement by a sudden cut of a strong producing interest. This is only a view held and has no basis at present to stand upon.

Old Rails.—A drop of 50c. per ton is reported to-day on old rails.

Scrap.—The leading scrap dealers have made contracts for the delivery of a good deal of scrap between now and April 1st, but they refuse to give the prices. The old quotations are correct for the small daily transactions heard of.

Pittsburg. Dec. 12.
(From Our Special Correspondent.)

The past week has been quiet. Demand for raw material has practically fallen off altogether, although the demand for finished lines is good for this season of the year. The plate-makers' agreement was finally concluded in New York last week and at the same meeting it was decided to advance the price of all kinds of plates \$1 per ton. The plate mills of the country are pretty well filled up on orders placed during the past few months and one of the largest producers has enough tonnage booked to keep his mills in full operation for several months. Nothing has yet been done toward fixing lower railroad freight rates out of Pittsburg to the seaboard, but there is every indication that this matter will be settled by the first of the year, when it has been practically decided that the rates will become effective. The lack of demand for Bessemer iron has resulted in the making of lower prices.

Pig Iron.—Demand for foundry iron has fallen off to a marked extent during the past 10 days, and only small lots for immediate delivery are now being placed. Prices, too, are somewhat weaker and small lots have been placed during the week at \$14@14.50 per ton delivered, Pittsburg. Foundry No. 1 and No. 3 are in little demand. Several thousand tons of forge iron were placed during the week at \$13.25@13.50, Pittsburg. In Bessemer iron there is practically nothing doing. Round lots have been offered here during the week at very low prices and we quote Bessemer at \$13, nominally, delivered Pittsburg.

Steel.—The steel billet manufacturers continue to hold to their pooling arrangement and are making few sales. Bessemer billets, 4x4, are held at \$19.75 per ton delivered, Pittsburg, Wheeling or Valley. Open-hearth billets are \$1 per ton higher and tin and sheet bars are held at the same price as the latter.

Plates.—At the meeting of the plate manufacturers' association held in New York last week the price of 1/4-in. tank plates were advanced \$1.40 per ton; flange and boiler steel, \$0.50; marine and ordinary fire-box, \$1.60.

Bars.—Steel bars are held at a minimum of 1.25c., white small lots bring 1.30@1.35c. Iron bars are held at 1.35c., delivered Pittsburg. Refined iron bars are held at 1.80@2c.

Sheets.—The demand for black and galvanized sheets continues strong. No. 28 gauge, black sheets, are held at 2.90@3c., while No. 27 are held at 2.80@2.90c. Galvanized sheets are held at 70 and 10 off, with no freight allowance.

New York. Dec. 14.

The local iron market is quieter, with prices firm. No increase in activity is to be expected until well into January. In foreign trade shipments of certain lines of finished goods, particularly machine tools, to European ports have been falling off for some months. Among recent shipments we note shipments of \$15,000 worth of manufactured iron and a large amount of railway and contractors' supplies to Brazil; \$25,000 worth of trolley poles and \$53,000 worth of finished steel to England, and \$60,000 worth of manufactured iron to Australia.

Pig Iron.—Buying is confined almost wholly to small lots and the market is inclined to be quiet. We quote for Northern irons, tidewater delivery: No. 1 X foundry, \$16.75@17.75; No. 2 X, \$15.50@16; No. 2 plain, \$15@15.25; gray forge, \$14.50@14.75. For Southern irons on dock, New York No. 1 foundry, \$15.25@15.75; No. 2, \$14.50@15; No. 3, \$14.25@14.50; No. 4, \$13.50@14; No. 1 soft, \$15.50@15.75; No. 2, \$14.25@14.50.

Bar Iron and Steel.—Demand holds up fairly well. We quote common bars at 1.35c. for large bars on dock; refined bars, 1.45c.; soft steel bars, 1.40c.

Plates.—The plate pool is now in full control and prices are higher. We quote for large lots at tidewater: Tank, 1/4-in. and heavier, 1.65c.; flange, 1.75c.; marine, 1.85c.; firebox, 1.85c.; universal, 1.60c.

Steel Rails and Rail Fastenings.—Sales are light, with prices maintained. Light rails are selling between \$25@30. Standard sections are quoted at \$26. Splice bars are 1.35@1.40c.; spikes, 1.55c.; fish plates, 1.35c.; bolts, 2.10@2.30c.

Structural Materials.—Demand has fallen off. We continue to quote large lots at tidewater: Beams, 1.65c.; channels, 1.65c.; angles, 1.30c.; tees, 1.70c.; zees, 1.65c.

METAL MARKET.

New York. Dec. 14.

Gold and Silver.

Gold and Silver Exports and Imports
At all United States ports in October and year.

Metal.	October.		Year.	
	1899.	1900.	1899.	1900.
GOLD.				
Exports	\$379,752	\$428,925	\$33,257,590	\$53,005,470
Imports	8,542,254	9,810,832	42,810,675	45,915,798
SILVER.				
Exports	4,687,226	6,091,119	43,421,657	53,595,010
Imports	2,321,935	2,866,356	25,045,790	33,117,506
Excess	E. \$2,361,531	E. \$3,12,763	E. \$18,375,867	E. \$20,477,504

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

Gold and Silver Exports and Imports, New York
For the week ending December 30th, 1900, and for years from January 1st, 1900, 1899, 1898, 1897.

Period.	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
We'k	\$7,000	\$27,917	\$659,005	\$58,401	E. \$679,787
1900..	36,702,393	10,816,591	37,156,023	4,621,062	E. 58,414,763
1899..	11,746,396	13,825,349	25,205,408	3,716,056	E. 22,489,790
1898..	8,603,024	98,157,091	35,025,503	3,109,952	E. 59,844,116
1897..	29,799,881	43,207,861	34,364,978	3,024,733	E. 18,521,766

The gold exported for the week, this year, went to Central America, while that imported came from Central and South America. Of the silver exported, \$619,105 (954,163 fine oz.) was in bullion, which went to London and France; the imports were from Central and South America and the West Indies.

The United States Assay Office in New York reports the total receipts of silver at 31,000 oz. for the week. Total since January 1st, 4,632,000 oz.

Average Prices of Silver per oz. Troy.

Month.	1900.		1899.		1898.	
	London Pence.	N. Y. Cents.	London Pence.	N. Y. Cents.	London Pence.	N. Y. Cents.
January...	27.30	59.30	27.42	59.36	26.29	56.77
February...	27.49	59.76	27.44	59.42	25.89	56.07
March.....	27.59	59.81	27.48	59.64	25.47	54.90
April.....	27.41	59.59	27.65	60.10	25.95	56.02
May.....	27.56	59.96	28.15	61.25	26.31	56.98
June.....	27.81	60.42	27.77	60.43	27.09	58.61
July.....	28.23	61.25	27.71	60.26	27.39	59.06
August....	28.13	61.14	27.62	60.00	27.48	59.54
September..	28.85	62.63	27.15	58.89	28.05	60.68
October...	29.58	63.83	26.70	57.98	27.90	60.42
November...	29.66	64.04	27.02	58.67	27.93	60.60
December..	.....	.....	27.21	58.99	27.45	59.42
Year.....	.....	.....	27.44	59.58	26.76	58.20

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

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars.....	\$.50 1/2	\$.51 1/4
Peruvian soles and Chilean pesos....	.46	.47 1/4
Victoria sovereigns.....	4.85	4.88
Twenty francs.....	3.85	3.88
Twenty marks.....	4.74	4.80
Spanish 25 pesetas.....	4.78	4.82

Imports and Exports of Metals.

Port.	Week, Dec. 12.		Year 1900.	
	Expts.	Impts.	Expts.	Impts.
New York. (N. Y. Metal Exchange.)				
Aluminum.....long tons	12	.....	144	96
Antimony ore.....	.....	.....	.....	2,845
" regulus.....	.....	.....	.....	1,930
Chrome ore.....	.....	.....	.....	1,500
Copper, fine.....	2,523	503	96,134	18,677
" matte.....	224	.....	4,569	268
" ore.....	.....	.....	.....	55,869
" ash.....	.....	.....	.....	98
Ferro-Chrome.....	.....	.....	.....	31
Ferro-manganese.....	.....	53	.....	763
Iron ore.....	.....	.....	.....	21,499
" pig, bar, rod.....	2,459	.....	23,169	6,147
" pipe.....	445	.....	14,649	157
" plates, sheets.....	55	25	1,071	43
Lead.....	1,959	1,100	75,066	64,849
" ore.....	.....	.....	.....	9,700
" dross.....	.....	.....	.....	24
Manganese ore.....	.....	1,000	.....	11,492
Metals, old, scrap.....	140	35	5,304	6,338
" composition.....	583	.....	4,314	385
Nails.....	413	.....	19,505	.....
Nickel.....	56	6	2,334	114
" ore, matte.....	.....	.....	.....	5,398
Rail'd material.....	2,225	.....	9,671	5,812
Rails, old.....	149	.....	8,156	518
Spiegeleisen.....	.....	.....	.....	3,407
Steel bars, plates.....	3,490	336	54,280	16,622
" rails.....	1,286	.....	61,504	176
" wire.....	1,983	.....	29,990	78
" not spec'd.....	1,356	58	18,528	2,816
Tin.....	.....	.....	5	23,856
" and black plates.....	.....	397	65	34,141
Zinc.....	.....	.....	.....	450
" dross.....	.....	.....	.....	765
" ashes, skim.....	.....	.....	.....	1,279
" ore.....	.....	.....	.....	13,304
Baltimore. (Special Correspondence.)				
Antimony.....long tons	.....	.....	.....	5
Chrome ore.....	.....	.....	.....	6,905
Copper, fine.....	376	132	38,304	4,751
Ferro-manganese.....	.....	.....	.....	150
Iron pig, bar, etc.....	.....	.....	4,900	23,212
" ore.....	.....	12,186	.....	405,925
" pyrites.....	.....	.....	.....	40,425
Manganese ore.....	.....	1,494	.....	119,407
Metals, old & Rails.....	.....	.....	.....	2
Nails.....	10	.....	1,573	.....
Pipe, iron & steel.....	24	.....	5,717	.....
Silicon.....	.....	.....	.....	85
Spiegeleisen.....	.....	.....	.....	1,157
Steel, bars, etc.....	3,452	.....	45,111	4,284
" wire.....	.....	.....	.....	971
" rails.....	5,215	.....	79,816	.....
Tin.....	.....	.....	.....	295
" and black plates.....	.....	.....	.....	3,327
Zinc.....	.....	.....	.....	5
Philadelphia. (Week ending Dec. 7)				
Antimony.....long tons	.....	.....	.....	14
Chrome ore.....	.....	.....	.....	3,650
Copper, fine.....	.....	.....	3,989	.....
" ore.....	.....	4,443	.....	43,815
" pyrites.....	.....	.....	.....	100
Iron, pig.....	.....	.....	1,355	3,929
" ore.....	.....	12,480	13,120	290,475
" pyrites.....	.....	.....	.....	87,465
Manganese ore.....	.....	.....	.....	77,328
Spiegeleisen.....	.....	.....	.....	4,153
Tin.....	.....	.....	10	683
" and black plates.....	.....	.....	.....	67
Zinc.....	.....	.....	.....	5,057
" ore.....	.....	.....	.....	.....

Total United States.

Articles.	Oct. 1900.		Year, 1900.	
	Expts.	Impts.	Expts.	Impts.
Antimony.....long tons	.....	122	11	1,330
" ore.....	.....	378	.....	2,132
Copper, in all forms.....	.....	.....	.....	.....
" iron, pig & bar.....	12,682	7,561	138,833	61,955
" ore.....	66,375	3,006	234,924	62,512
" pyrites.....	8,820	65,311	46,846	772,608
Iron & steel plates.....	6,279	156	40,051	4,726
Iron & steel rails.....	86,628	.....	330,739	991
" wire.....	6,499	141	65,654	1,479
Lead, in all forms.....	.....	7,131	.....	81,771
Manganese ore.....	.....	.....	.....	.....
" and oxide.....	.....	1,906	3	249,454
Nickel " & matte.....	.....	.....	.....	2,201
Nails, cut.....	626	.....	.....	9,149
" wire.....	1,303	.....	.....	24,227
Quicksilver.....	22	.....	.....	299
Steel, billets, rods, etc.....	36,741	2,507	135,960	28,943
Tin.....	46	1,931	441	26,416
" & black plates.....	22	3,087	543	53,799
Zinc.....	171	50	18,470	814
" ore.....	1,637	.....	31,602	.....

Import Duties on Metals.

The duties on metals under the present tariff law are as follows: Antimony, metal or regulus, 3/4c. a lb. Lead, 1/4c. a lb. on lead in ores; 2 1/2c. per lb. on pigs, bars, etc.; 2 1/2c. on sheet, pipe and manufactured forms. Nickel, 6c. per lb. Quicksilver, 7c. per lb. Spelter or zinc, 1 1/2c. per lb. on pigs and bars, 2c. on sheets, etc. Copper, tin and platinum are free of duty.

Average Prices of Metals per lb., New York

Month.	COPPER.		TIN.		LEAD.		SPELTER.	
	1900.	1899.	1900.	1899.	1900.	1899.	1900.	1899.
Jan.....	15.58	14.26	27.07	22.48	4.65	4.18	4.65	5.34
Feb.....	15.78	17.02	30.58	24.20	4.675	4.49	4.64	6.28
March....	16.29	16.35	32.90	23.82	4.675	4.37	4.60	6.31
April.....	16.76	17.13	30.90	24.98	4.675	4.31	4.71	6.67
May.....	16.34	17.20	29.37	25.76	4.181	4.44	4.53	6.88
June.....	15.75	16.80	30.50	25.85	3.901	4.43	4.29	5.98
July.....	15.97	17.10	33.10	29.63	4.030	4.52	4.28	5.82
Aug.....	16.35	17.42	31.28	31.53	4.250	4.57	4.17	5.65
Sept.....	16.44	17.34	29.42	32.74	4.350	4.58	4.11	5.50
October..	16.37	16.94	28.54	31.99	4.350	4.575	4.15	5.32
Nov.....	16.40	16.49	28.25	28.71	4.350	4.575	4.29	4.64
Dec.....	16.40	16.49	28.25	28.71	4.350	4.575	4.29	4.64
Year.....	16.67	16.67	25.12	25.12	4.47	4.47	4.47	5.75

Commencing with March 17th, the prices given in the table for copper are the averages for electrolytic copper; this is the case for both 1899 and 1900. The average price for Lake copper for the year 1899 was 17.61c. For January, 1900, the average price of Lake copper was 16.53c.; for February, 16.08c.; for March, 16.55c.; for April, 16.94c.; for May, 16.55c.; for June, 16c.; for July, 16.16c.; for August, 16.58c.; for September, 16.69c.; for October, 16.64c.; for November, 16.90c.

Financial Notes of the Week.

But little change is to be reported in general business conditions. The usual lull which marks the close of the year begins to be apparent, and matters will doubtless be quiet for the next three weeks. Money is at rather higher rates in New York. Foreign rates continue high and there is little or no withdrawal of American balances.

The tone of the silver market has been steady, with slightly advancing tendency. A French order for 900,000 oz. was apparently the occasion of higher figures on the 12th.

The statement of the New York banks—including the 66 banks represented in the Clearing House for the week ending December 8th—gives the following totals, comparison being made with the corresponding week in 1899 and 1898:

	1898.	1899.	1900.
Loans and discounts, \$697,747,400	\$682,159,800	\$906,442,500	
Deposits	789,525,800	861,044,700	
Circulation	16,439,200	16,480,900	
Reserve:			
Specie	158,462,300	145,314,500	
Legal tenders	56,017,100	58,157,900	
Total reserve	\$214,479,400	\$203,472,400	
Legal requirements	197,381,450	187,019,500	
Balance, surplus ...	\$17,097,950	\$16,452,900	

Changes for the week, this year, were an increase of \$1,944,400 in loans and discounts; decreases of \$3,366,200 in deposits, \$62,000 in circulation, \$4,090,600 in specie, \$1,915,500 in legal tenders, and \$5,164,550 in surplus reserve.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced to dollars, and comparison is made with the holdings at the corresponding date last year:

Banks.	1899.		1900.	
	Gold.	Silver.	Gold.	Silver.
N.Y. Ass'n.....	\$145,314,500	\$162,804,400		
England.....	153,985,970	156,015,625		
France.....	377,436,685	\$233,535,380	464,857,360	\$222,021,295
Germany.....	121,980,000	62,840,000	131,335,300	69,205,000
Spain.....	68,000,000	70,880,000	69,540,000	81,750,000
Neth'lds.....	18,775,000	29,385,000	24,385,000	27,725,000
Belgium.....	14,550,000	7,275,000	14,065,000	7,030,000
Italy.....	77,255,000	7,470,000	77,255,000	8,675,000
Russia.....	439,010,000	23,765,000	364,910,000	31,005,000

The returns of the Associated Banks of New York are of date December 8th, and the others are of date December 7th, as reported by the "Commercial and Financial Chronicle" cable. The New York banks do not export silver separately, but the specie carried is chiefly gold coin. The Bank of England reports gold only.

Shipments of silver from London to the East for the year up to November 29th, 1900, are reported by Messrs. Pixley & Abell's circular as follows:

	1899.	1900.	Changes.
India	\$4,800,725	\$6,920,557	£2,110,832
China.....	1,265,978	2,016,186	£ 750,208
The Straits.....	209,506	764,316	£ 494,810
Totals	\$6,276,209	\$9,701,059	£ 3,424,850

Arrivals for the week, this year, were £212,000 in bar silver from New York, £11,000 from the West Indies and £13,000 from Chile; total, £236,000. Shipments were £80,000 in bar silver to Bombay and £20,000 to Calcutta; total, £100,000.

Indian exchange continues firm at 15.97d. per rupee, the price being maintained largely because of the limited amount of Council bills offered in London. The amount sold since April 1st, the beginning of the Indian fiscal year, this year has been only 86,967,908 rupee, against 182,507,341 rupees last year.

Other Metals.

Daily Prices of Metals in New York.

December.	Sterling Exchange.	Silver.		Copper.				Spelter.	
		Fine oz. Cts.	London, Pence.	Lake, cts. @ lb.	Electrolytic @ lb.	London, # ton.	Tin, cts. @ lb.	Lead, cts. @ lb.	N. Y. cts. @ lb.
8	4.85	64 1/2	29 1/2	16 1/2	16 1/2	27 1/2	4.32 1/2	4.30	4.12 1/2
10	4.85	64 1/2	29 1/2	16 1/2	16 1/2	27 1/2	4.32 1/2	4.27 1/2	4.10
11	4.84 1/2	61 1/2	29 1/2	16 1/2	16 1/2	27 1/2	4.32 1/2	4.25	4.05
12	4.84 1/2	64 1/2	29 1/2	16 1/2	16 1/2	26 1/2	4.32 1/2	4.25	4.05
13	4.84 1/2	64 1/2	29 1/2	16 1/2	16 1/2	26 1/2	4.32 1/2	4.25	4.05
14	4.84 1/2	64 1/2	29 1/2	16 1/2	16 1/2	26 1/2	4.32 1/2	4.25	4.05

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

Copper.—There is no change in the condition of the market as given in our last issue. We learn of but few transactions and in some instances it would appear that slight concessions have again been made, but producers, generally, seem to be well sold both for early and distant shipments. Consumption continues good, and we learn that manufacturers are booking a fair volume of future business. We quote Lake copper at 16 1/2c.; electrolytic in cakes, wirebars and ingots at 16 1/2c.; in cathodes at 16@16 1/2c.; casting copper at 16 1/2c.

The market for standard copper in London, which closed last week at £72 2s. 6d. for spot, £72 15s. for three months, opened at £71 17s. 6d. for spot, £72 10s. for three months. On Tuesday it was £71 10s. for spot, £72 5s. for three months, and on Wednesday £71 5s. for spot, £71 17s. 6d. for three months. It closes at £71 7s. 6d. for spot, £72 for three months.

Refined and manufactured sorts we quote: English tough, £75 10s.@£76; best selected, £78 @£78 10s.; strong sheets, £85; India sheets, £82; yellow metal, 7d.

Official reports give the total quantity of blister copper shipped from Tasmania to the United States during the year ending June 30th, 1900, at 4,024 tons. Of this 2,464 tons were shipped in the six months ending June 30th, 1900. This copper comes from the Mount Lyell smelting works, and is sent here to be refined.

Tin.—The market this week has again experienced a most violent slump, London showing a decline of almost £5, which makes a reduction of £10 within two weeks. In consequence, business on this side has been very much restricted, sellers, on the one hand, not wishing to go on at the lower prices, and buyers, on the other, not knowing whether to take hold. The fight in London between the bear and bull operators has become very bitter, and the latter still believe that their day will come. Our market here has not declined to the extent of that in London, spot tin being still very scarce and arrivals scant. At the close we quote spot at 26 1/2c., January delivery at 26 1/2c.

The London market, which last week closed at £120 15s. for spot and the same for three months, opened at £121 15s. for spot, £121 12s. 6d. for three months. On Tuesday it was £119 10s. for spot, £119 7s. 6d. for three months; on Wednesday it declined £3 10s. to £116 for spot and for three months. The market reacted on Thursday to £117 5s. for spot and three months, and it closes at £117 17s. 6d. for both spot and three months.

Lead.—A large business has been done at the last prices, viz., 4.32 1/2@4.37 1/2c. New York, 4.22 1/2@4.32 1/2c. St. Louis.

The market for Spanish lead is somewhat lower, the last quotation being £16 2s. 6d., with English lead quoted 2s. 6d. higher.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is steady, with a fair demand for Missouri brands at 4.22 1/2c. At this figure latest transactions are recorded. Argentiferous lead is firmly held at 4.32 1/2c. and is selling in a limited way at that price.

Spelter.—A fair business is reported this week, but at somewhat lower prices. St. Louis delivery being quoted at 4.05c., New York at 4.25c.

Our cables report the foreign market as £18 15s. for good ordinaries, specials 5s. higher.

Antimony.—We quote Cookson's at 10c.; Hallitt's at 9 1/2c.; U. S. Star, 9 1/2c.

Nickel.—The price continues firm at 50@60c. per lb., according to size and terms of order.

Platinum.—Consumption continues good and prices are strong. For ingot platinum in large quantities \$18.20 per Troy oz. is quoted in New York. In London a recent quotation gives 75s. per ounce, unmanufactured, and 77s. 6d.@80s. for crucibles, etc. This is very nearly on a parity with New York prices.

Chemical ware (crucibles and dishes), best hammered metal from store in large quantities, is worth 72c. per gram.

Quicksilver.—The New York quotation continues unchanged at \$51 per flask for large lots, with \$52.50@54 asked for small quantities. San Francisco prices are \$48 on local deliveries, and \$43.50@44 on export orders. The London price is £9 2s. 6d. per flask, with the same price named from second hands.

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

	Per lb.	Per lb.
Aluminum, No. 1, 99% ingots	33@37c.	Ferro-Titanium (20%) .. \$1.00
No. 2, 90% ingots	31@34c.	Ferro-Tungsten (37%) .. 32c.
Rolled sheets	42c. up	Magnesium
Alum.-bronzes	20@23c.	Manganese (over 99%) .. \$1.05
Nickel-alum	33@35c.	Mangan'c Cop. (2 1/2% Mn) 32c.
Bismuth	\$2.25	Mangan'c Cop. (30% Mn) 38c.
Chromium (over 99%)	1.00	Molybdenum (Best) .. \$1.45
Copper, red oxide	50c.	Phosphorus
Ferro-Molyb'dum (50%)	\$1.00	American
Ferro-Titanium (10%)	90c.	Tungsten (Best)

Variations in prices depend chiefly on the size of the order.

LATE NEWS.

The following circular was issued late on December 13th to the stockholders of the Pennsylvania Coal Company:

"The undersigned directors and stockholders of the Pennsylvania Coal Company have received an offer from Messrs. J. P. Morgan & Co. to purchase their stock on the terms stated in the accompanying circular, signed by that firm. Deeming the offer advantageous, they have accepted the same, and sold all their stock to that firm.

"The undersigned were unwilling to dispose of their stock unless Messrs. J. P. Morgan & Co. would also agree to purchase on the same terms the stock of all other stockholders which might be offered to them on January 15th, 1901, or within 30 days thereafter, or within a short additional time in the case of any stockholder who should be prevented by causes beyond his control from presenting his stock within the said period.

"As stated in the circular issued by Messrs. J. P. Morgan & Co., the sale of stock does not carry with it any interest in certain treasury assets of the company, which have been reserved for distribution as a dividend among the stockholders of record at the closing of the transfer books on January 8th, 1901, at 3 p. m. In the opinion of the undersigned these assets have a value of at least \$10,000,000, equal to a dividend of at least 200%, the equivalent of \$100 per share, which, added to the price of 55 1/2%, equal to \$276 per share, to be paid by Messrs. J. P. Morgan & Co., would make the aggregate amount to be received by the stockholders, on sale of their stock, at least 75 1/2%, equal to \$376 per share, the par value of each share being only \$50. It is expected that the treasury assets of the company will be promptly liquidated, so that dividend from a very large proportion of such assets will, in all probability, be distributed and paid through Messrs. J. P. Morgan & Co. simultaneously with the payment for shares sold and delivered to them; and the remaining assets will, as rapidly as they can be converted into cash, be paid over to the stockholders of record on January 8th, 1901, at 3 p. m., as aforesaid.

"The undersigned directors and stockholders strongly recommend the acceptance of the offer by the other stockholders."

This circular was signed by the directors and several large holders of stock. The appended circular from J. P. Morgan & Co. was as follows:

"We have purchased a large amount of the stock of the Pennsylvania Coal Company, including all the stock held by the directors and larger shareholders of the company. It is stipulated as a condition of such purchase that we shall offer to all other stockholders, electing to avail themselves thereof, the opportunity to sell their stock to us on the same terms. This we are prepared to do.

"Holders desiring to sell their stock must deliver valid certificates thereof duly indorsed in blank and in lawful shape for transfer, at our office, No. 23 Wall street, in the city of New York, on January 15th, 1901, or at any time within 30 days thereafter, and will receive cash therefor at the rate of 55 1/2%, equal to \$276 per share, each share being of the par value of \$50. Such sale carries no interest to us in certain treasury assets of the company, which have been reserved from sale and which are to be liquidated by the company and distributed as an extraordinary dividend to the shareholders of record on January 8th, 1901, at 3 p. m.

"We have agreed to pay, for account of the company, simultaneously with the purchase of the stock, any dividend out of such treasury assets which shall previously have been declared and paid over to us in cash for distribution to the shareholders."

CHEMICALS AND MINERALS.

(For further prices of chemicals, minerals and rare elements, see page 720.)

New York. Dec. 14.

Heavy Chemicals.—Many of the large consumers have already placed their contracts for 1901 and some for 1902. Consequently prices are generally firmer. Alkali and caustic soda, domestic makes, are higher for shipment, while the little spot business doing is chiefly in the hands of jobbers.

Sal soda is in fair demand. Further contracts for 1901 bleaching powder have been booked at quotations below, while immediate shipments are handled by re-sellers. Chlorate of potash, American powdered, is scarce and so are English crystals and powdered.

The Grasselli Chemical Company's new plant at Powderly, near Birmingham, Ala., has begun making heavy chemicals, including sulphuric acid. The raw material is obtained largely in Alabama. Brunner, Mond & Company, of England, have declared an interim dividend of 30% for the half-year ended September last, on the ordinary shares, free of income tax, and 7% on the preferred shares, subject to income tax. The corresponding dividends last year were the same.

We quote per 100 lbs. as follows: Domestic soda ash in bulk is worth 2 1/4 c. per 100 lbs. less than quotations below.

Articles.	Domestic.		Foreign.
	F.o.b. Works.	In New York.	
Alkali, 58%.	75@80	.....	.....
48%.	80@85	.....	.....
Caustic Soda, high test	.....	.....	.....
powd. 60%	\$1.75@1.90	2.75	.....
70@74%.	.....	2.85	.....
98%.	.....	3.25	3.75@4.00
Sal Soda	60@70	.....	65@71 1/4
"conc.	1.12@1.175	.....	1.75
Bicarb. Soda, 1.00@1.12 1/2	.....	.....	1.37 1/2@1.75
"extra	3.25@3.50	.....	.....
Bleach Pdr.	.....	.....	2.00@2.10
Eng. prime.	.....	.....	1.90@1.95
other brands.	.....	.....	9.75@10.00
Chl. Pot. cryst.	.....	8.50	9.75@10.00
powd.	8.75@9.00	.....	9.75@10.00

Mineral Paints.—On December 20th the leading dry color makers in this country are to meet in New York to negotiate a consolidation of all the plants. It is the intention of the promoters to regulate the industry to re-establish better prices and to avoid adulteration of the various mineral and metallic paints.

Acids.—Contracts for 1901 are being booked on basis of quotations below. Some oxalic contracts were taken at \$5.50 per 100 lbs. for German brands, but English is unchanged. Blue vitriol is quiet.

Quotations as below are for large lots delivered in New York and vicinity, per 100 lbs. unless otherwise specified.

Acetic, No 8 in lbs.	\$1.62 1/4	Nitric, 38°	\$3.87 1/2
Blue Vitriol.	5.00@5.25	Nitric, 38°	4.12 1/2
Aqua Fortis, 38°	3.62 1/2	Nitric, 40°	4.37
Aqua Fortis, 38°	3.87 1/2	Nitric, 42°	4.75
Aqua Fortis, 40°	4.12 1/2	Oxalic	5.50@6.00
Aqua Fortis, 42°	4.50	Sulphuric, 66°	1.20
Muriatic, 18°	1.20	Sulphuric, 60°	1.05
Muriatic, 20°	1.35	" bulk 50° ton	14.00
Muriatic 22°	1.50		

Brimstone.—Cable advices state that the Sicilian miners have not yet acquiesced in the agreement proposed by the trust. Consequently the market is quiet and prices are nominally unchanged. Best unmixed seconds sold on spot at \$22@22.50 per long ton, while shipments are quoted at \$20.75@21. Best thirds are worth \$2 per ton less. We are advised that the total shipments of brimstone from Sicilian ports to all countries in October amounted to 52,566 long tons, against 38,940 tons last year; an increase of 13,626 tons. The shipments to the United States alone amounted to 12,040 long tons of best unmixed seconds and 3,630 tons best thirds; total, 15,670 tons, against 10,355 tons in October, 1899; an increase of 5,315 tons this year. Stocks in Sicily on October 31st were 229,597 tons, against 265,129 tons last year; showing a decrease of 35,532 tons in 1900.

The Virginia-Carolina Chemical Company is to operate a line of steamships between Norfolk, Va., and Tampico, Mexico. The company has recently acquired in Mexico a large amount of mining property, which contains extensive deposits of sulphur. These deposits will be worked by the company and the mines developed.

Pyrites.—Business continues good, and prices are nominally unchanged. We quote as follows: Mineral City, Va., lump ore (basis 45%), \$4.75 per long ton and fines \$4.20. Charlemont, Mass., lump, \$5.50 and fines \$5. Spanish pyrites, 12 @14c., as to percentage of sulphur contents, delivered ex-ship New York and other Atlantic ports. Spanish pyrites contain from 46@51% of sulphur; American from 42@44%.

Fertilizing Chemicals.—Dull. Sulphate of ammonia, gas liquor, for shipment is higher at \$2.80 @ \$2.82 1/2 per 100 lbs. Other quotations are: High grade blood, \$2.20@2.25 per unit for soft New

York and \$2.05 for Western, f. o. b. Chicago; tankage, \$1.87 1/2 @ \$1.90 and 10c. per unit for 9 and 20% f. o. b. Chicago; Calcutta bone-meal, regular, \$22 per ton, and \$19 for other grades; domestic steamed ground bone, \$18@19.50 per ton.

Nitrate of Soda.—The three steamers that arrived last week have all finished discharging their cargoes. A great deal of this nitrate of soda changed hands at \$1.75@1.77 1/2 per 100 lbs. Spot at the close is quoted higher at \$1.82 1/2, and very little is being offered. Futures are firm at \$1.82 1/2. Shipments from the West Coast of South America have been delayed and importers say if any demand arises between now and February 1st the market can easily advance 10 or 15 points. In the primary market higher prices rule, owing to the scarcity of refined nitrate of soda, and to the firmness of the producers' combination. Deliveries have been heavy and will doubtless increase with the approach of the fertilizer season. Freight rates are easier.

Messrs. Jackson Brothers, of Valparaiso, Chile, write us as follows, under date of November 3d: Since the formation of the combination producers in general have not been disposed to operate except at a considerable advance in prices. Transactions during the fortnight amounted to about 500,000 qtls. at prices ranging from 5s. 6 1/2 d. @ 5s. 8 1/2 d. for 95% and at 5s. 8d. for refined. The combination has been formed for a period of 5 years to commence from April 1st, 1901, the exports for each year to be fixed before May 15th, liable to alteration, on or before July 15th, at an extraordinary general meeting, by a majority of 65% of the allotted quotas. The exports for the first year is fixed at \$1,243,000 qtls. In any case, the exports for each of the following years cannot be less than the consumption during the previous period from May 1st to the following April 30th. Stocks held on December 31st, 1900, which are not shipped and dispatched on or before March 31st, 1901, are considered as part of the quota corresponding to the first year, as also that part of the production of the first three months which the Directory resolves during the month of January should also be shipped before March 31st. Exports during October reached 4,765,000 qtls., making a total for the 10 months of 22,640,000 qtls., being a decrease of 850,000 qtls. as compared with the same period last year. We quote 95% November-December, 5s. 8 1/2 d.; refined, 5s. 10d., ordinary terms. The price of 5s. 8 1/2 d. with 35s. freight stands in 8s. 1 1/4 d. per cwt. net cost and freight without purchasing commission.

Phosphates.—Trade is quiet; prices unchanged. The exports of domestic phosphates in the 10 months ended October 31st amounted to 527,101 long tons, showing a decrease of 230,111 tons, or 43.7%, as compared with the same time last year. This falling off is due largely to the smaller exports to Great Britain and Germany. Shipments of high-grade Florida rock from Savannah in November amounted to 15,491 tons, making 112,163 tons in the 11 months, against 92,287 tons last year, showing an increase of 19,876 tons this year.

The shipments of high-grade Florida rock in the 10 months ending October 31st are reported to us by Messrs. Auchincloss Brothers, as below, in long tons of 2,240 lbs.:

Ports.	1899.	1899.	1900.
Continental.	175,994	242,416	179,475
Baltic.	91,686	112,554	91,076
United Kingdom	25,762	28,847	25,047
Mediterranean.	10,771	7,711	3,852
Other ports.	3,642	5,673	3,903
Total	307,755	397,201	313,353

The falling off this year amounts to 93,843 tons as compared with last year, owing chiefly to the high ocean freight rates and scarcity of vessel room. In the "other ports" are included the shipments to Australia, amounting to 1,660 tons (2,250 tons in 1899); and to Honolulu, 2,248 tons, which is a noteworthy shipment. No shipments have been made to domestic superphosphate manufacturers so far this year.

In the producing districts, Mt. Pleasant, Tenn., has about 75,000 tons of rock ready for shipment. In South Carolina the Coosaw Company alone carries about 60,000 tons, which cannot

Phosphates.	Per Ton F. o. b.	C. i. f. Un'd Kingdom or European Ports.	
		Unit.	Long ton.
*Fla. hard rock (77 @ 80%)	\$7.50@8.00	8 1/4 @ 8 1/2 d	\$12.87@13.26
*Fla. land pebble (68 @ 73%)	4.35	7 3/4 @ 7 1/2 d	10.15@10.50
*Fla. Peace River (58 @ 63%)	3.00@3.50	6 1/4 @ 7 1/2 d	7.50@8.70
†Tenn. rock 78% export.	3.50@3.75	7 1/4 @ 7 1/2 d	11.31@11.70
†Tenn. " 78% domestic.	3.00@3.50	.....	.....
†Tenn. " 75%	2.75@3.00	.....	.....
†Tenn. " 72%	2.25@2.65	.....	.....
‡So. Car. rock, crude....	4.00	.....	.....
‡So. Car. rock, dried....	4.50	6 1/2 d	7.80
Algerian, rock... (63 @ 70%)	.....	7 @ 7 1/2 d	9.33@10.05
Algerian, rock... (58 @ 63%)	.....	6 1/2 @ 7 1/2 d	7.80@8.70

* Fernandina. † Mt. Pleasant. ‡ At mines. § On vessels, Ashley River.

be shipped until vessels can be secured. It is said that Japan is a promising consuming territory for South Carolina rock and some shipments

have already been made to that country. Unfortunately, the present high freight rate forbids any large movement just now. The Florida miners are working mostly on old orders, and many of the plants are still closed down.

Liverpool. Nov. 29. (Special Report of Joseph P. Brunner & Co.)

Since our last report there is no change to report in the position of heavy chemicals.

Soda ash continues to meet with a good inquiry. Quotations vary according to export market, but range for tierces may be called about as follows: Leblanc ash, 48%, £5 12s. 6d. @ £5 17s. 6d.; 58%, £6 2s. 6d. @ £6 7s. 6d. per ton, net cash. Ammonia ash, 48%, £4 10s. @ £4 15s.; 58%, £4 15s. @ £5 per ton, net cash. Bags, 5s. per ton under price for tierces. Soda crystals are in steady request, although not active, while prices are firm at £3 7s. 6d. per ton, less 5% for barrels, or 7s. less for bags, with special quotations for a few favored markets. Caustic soda is not quite so brisk this week, but quotations are fully maintained, as follows: 60%, £9 5s.; 70%, £10 5s.; 74%, £10 15s. @ £10 17s. 6d.; 76%, £11 5s. @ £11 10s. per ton, net cash.

Bleaching powder is held for £6 10s. @ £7 per ton, net cash, for hardwood, as to market, with a moderate export business passing. Chlorate of potash is unchanged and quiet at 3 1/4 d. per lb., net cash.

Bicarb. soda is selling to a moderate extent, at £6 15s. per ton, less 2 1/2% for the finest quality in 1 cwt. kegs, with the usual allowances for larger packages; also special terms for a few favored markets.

Sulphate of ammonia is a shade easier at £11 @ £11 5s. per ton, less 2 1/2% for good gray 24@25% in double bags f. o. b. here, without much going on.

Nitrate of soda is selling on spot to a limited extent, at £8 10s. @ £8 15s. per ton, less 2 1/2% for double bags f. o. b. here, as to quality.

MINING STOCKS.

Complete quotations will be found on pages 717 and 718 of mining stocks listed and dealt in at:

Boston.	Philadelphia.	Montreal.
Colo. Springs.	Salt Lake.	London.
Denver.	San Francisco.	Mexico.
New York.	Spokane.	Paris.
	Toronto.	

New York. Dec. 14.

The litigation in the Montana courts over property in which the Amalgamated Company is interested has weakened this stock, and incidentally caused some uneasiness in Anaconda stock. Early in the week Amalgamated stock sold on 'change up to \$93.25, but at the close it fluctuated around \$91. Anaconda brought \$47 1/4 @ \$48, closing at \$47 1/2. British Columbia copper weakened to \$19 1/2, but at the close it shows regaining strength, and is selling around \$20. Union Copper, of North Carolina, is erratic, selling between \$4.50@5. A sale of Arlington Copper, of New Jersey, is reported on curb at \$6.

American Smelting and Refining shares were strengthened early in the week by the announcement that favorable consideration would be given to the deal with the Guggenheims at next Tuesday's meeting. The common shares of the American Smelting and Refining Company were particularly strong, advancing several points to \$56 1/2, but later, owing to the report that no dividend is likely to be declared on these shares at the forthcoming meeting, sales were made down to \$53 1/4. The preferred stock sold at \$97 1/4 @ \$95 1/4.

In the Colorado gold list Portland, of Cripple Creek, sold at \$3.20@3.30, Elkton at \$1.90 and Jack Pot at 62@75c.

Horn Silver, of Utah, was lower on sales at \$1.15.

Of the few Comstocks traded in Consolidated California & Virginia brought \$1.40@1.35 and Ophir, 68@65c.

Auction sales were \$8,000 first mortgage 6% bonds Consolidated Lehigh Slate Company, Limited, of Pennsylvania, at \$900 for lot.

The International Clay Manufacturing Company has organized with a capital of \$500,000, under a New Jersey charter. The new company is closely identified with the National Fire Proofing Company, the directors being nearly the same. A large plant has been purchased at Perth Amboy, N. J., and offices will be opened in New York City, Boston and Philadelphia. The works at Perth Amboy will manufacture terra cotta fire proofing, and this, with the 5 plants operated by the National, will give the allied interests an annual capacity of about 300,000 tons.

Boston. Dec. 13.

(From Our Special Correspondent.)

The market has been one which would be rather puzzling to anyone who did not know how completely it has been run by insiders and in a certain interest. This week it has been apparently allowed to drift, but this was only on the surface. It was really well under control and could have been picked up at any minute, had it been worth while.

Just now we have the usual cry of active business when the January dividends come in for investment. This is true to a certain extent; at least we shall have no outside business until after the holidays.

The blind pool stocks were nominally weak, Amalgamated and Anaconda selling off several points, with some recovery later. Boston & Montana brought \$326 to-day, while Butte & Boston was quoted at \$81.

Of the Lake coppers, Calumet & Hecla was steady at \$800; Tamarack closes at \$280; Osceola, \$73; Wolverine, \$46; Baltic, \$28½; Atlantic, \$26; Trimountain, \$10; Arnold, \$5. There seems to be an increased inquiry for the minor Lake coppers, and there are plenty of people who are ready to unload them.

In the miscellaneous coppers Utah sold at \$46; Old Dominion, \$28; British Columbia Copper, \$19½; Santa Fe, \$6½@7.

Very little was done in the gold stocks. Centennial-Eureka brought \$25½; Cochiti, \$9½; Merced, \$5, and Melones, \$1@1½.

In the general list United States Oil was lower, at \$12@12½. Dominion Coal was quoted at \$39, and New England Gas and Coke at \$12. Dominion Steel sold at \$30.

The committee on stock list of the Boston Exchange has directed that the stock of the United States Mining Company be dropped from the unlisted sheet, and that the voting trust certificates be admitted for quotation on the unlisted sheet. Regular stock can be traded in when specified. The company states that any of the outstanding stock can be exchanged for voting trust certificates.

The National Mining and Smelting Company purposes erecting a plant near old Virginia City, S. Dak., 11 miles east of Deadwood. Dr. H. H. Muggley, formerly of Chicago, now of Deadwood, purchased the Bullion Mine a short time ago in the Bear Butte District, where he has 15 men employed. The smelting company was organized by him. The officers are: President, Byron Truell, Lawrence, Mass.; vice-president, Rufus R. Wade, Boston; secretary, William G. Reed, Boston; treasurer, Rudolph C. Surbridge, Boston; general manager, H. H. Muggley, Deadwood; J. Henry Reed, Westford, Mass.; George W. Young, Jr., Concord, Mass.; A. L. Lambert, Boston. Work, it is said, will start early in the year.

San Francisco. Dec. 8.

(From Our Special Correspondent.)

The market has been dull and rather weak in tone, though no decided fall in prices is noted. A drop in Ophir was the signal for declines in the whole list, but without any special cause.

Some quotations noted are: Consolidated California & Virginia, \$1.25; Ophir, 65c.; Gould & Curry, 54c.; Silver Hill, 52c.; Caledonia, 36c.; Sierra Nevada, 27c.; Best & Belcher, 24c.; Yellow Jacket, 22c.

The sales on regular call at the San Francisco Stock Exchange for the year to date compare as follows:

	1899.	1900.
January, shares	189,955	164,400
February	350,860	112,600
March	272,625	252,730
April	209,215	121,500
May	164,580	171,015
June	201,375	129,505
July	147,340	84,110
August	153,305	163,985
September	136,865	113,350
October	168,770	229,790
November	167,755	136,210
Total	2,094,645	1,578,595

A falling off of nearly 25% in sales does not show well for public interest in the market.

The Oil Exchange continues very active, with sales large. Some quotations noted are: Hanford, \$120; Kern River, \$17.50; Home, \$4.40; Oil City, \$3.75; West Shore, \$3.25; Occidental, 69c.; Caribou, 65c.; California Standard, 40c.

There are reports that the Standard Oil Company is negotiating for the property of several companies, chiefly in the Kern River field.

The Carey Mining and Milling Company has been organized with a capital stock of \$100,000. The directors are Wilson Carey, F. Hall, J. F. Towns, C. R. Root, and H. P. Smith. The group of mines to be developed is near Josephine, in El Dorado County, Cal.

The Grand View Gold Mining Company has recently been incorporated with a capital stock of \$250,000. Directors are C. W. Ayers, J. R. Scupham, Herbert Gayter, N. A. Rothchild, F. M. Parcells, Mrs. C. Ayers and Mrs. F. H. Gaytor. This company will work a gravel claim at Montezuma, in Tuolumne County, Cal.

In the Buckeye Mining District, 5 miles northeast from Redding, the discovery of a large body of bitumen is reported. Several hundred acres have been located.

The Bonanza King silver mine in the Trojan District, 25 miles north of Fenner, Cal., has been sold to a Philadelphia syndicate for \$25,000. The new owners propose to erect a 150-ton plant and develop the property on a large scale. The old workings had reached a depth of 800 ft. and produced about \$1,800,000 in bullion in 1882 and 1883.

London. Nov. 27.

(From Our Special Correspondent.)

The South African and West Australian sections of the mining market have been practically non-existent this week, and most of the speculative element has been directed toward Stratton Independence. For many weeks, now, there have been adverse rumors about this important Cripple Creek mine, and last week I mentioned that Mr. T. A. Rickard had been obliged to admit that his estimates of ore reserves were quite unreliable and that they were based not on his own examination, but on the manager's statements. The preliminary report by cable of Mr. John Hays Hammond, who was deputed to examine the property by the South African houses who have recently taken an interest in the promotions of the Venture Corporations, has just been received, and it shows that the future of the company is very unpromising. Mr. Hammond estimates that the ore in sight amounts to 120,000 tons of a gross value of \$2,300,000, and that the net profits will amount to about \$1,000,000. He is very sceptical about the chances of discovery of further ore bodies. The value of the ore in sight diminishes with depth, and the area hitherto unexplored holds out little promise of discovery of payable ore. In spite of this unfavorable outlook, Mr. Hammond recommends expenditure in prospecting within the confines of the property. The market is very much depressed by this report and the shares of the company are being sold wherever possible. They now stand at rather less than £1, their par value, so that the fall is considerable, seeing that at their most prosperous days they stood at nearly £3.

In spite of the bad times for mining companies, two offers have been made to the public for subscription to ventures connected with mining. One of these is the White Pass & Yukon Railway Company, Limited, which is offering £750,000 in debentures for the purpose of providing further capital and consolidating the various debts of the company. The company was brought out about two years ago and the directorate and clientele belong to influential London circles, and no doubt the proposition will be carried through without any difficulty. It seems, however, rather late in the day to be raising such large sums of money for a Klondike transport scheme.

The other new proposition placed before the public this week is the Loddon Valley Goldfields Limited, which is the latest flotation by the Whitaker Wright group. This company is introduced by the London & Globe Finance Corporation. Its capital is £750,000 and the object is to buy certain properties in the county of Talbot, province of Wellington, in the colony of Victoria, Australia. The properties are adjacent to the Berry deep leads in that district, and the promoters' experts consider that the properties to be acquired promise to be worth the purchase price. There is absolutely no independent evidence as to the nature of the properties, but once you support the Whitaker Wright circle, you always have to, or the whole house of cards will collapse, so no doubt this issue was sufficiently guaranteed before it was advertised. The number of subsidiary companies issued by the Whitaker Wright group is really alarming, and their total capitalization is prodigious. On the other hand, the dividends paid are microscopic and nobody but stock exchange gamblers and inexperienced fools are likely to put up capital in the form of subscriptions.

Paris. Dec. 2.

(From Our Special Correspondent.)

Somewhat better feeling prevails in our Bourse. I can hardly say that stocks are stronger or much more active, but the apprehension of panic is passing away, and the general impression is more hopeful.

One can hardly point to any special stocks as active, though the copper shares come nearest to it. There is still hesitation in the metallurgical shares. The African gold stocks are un-moved.

Two new copper companies, both organized in London, have been registered here, and the stocks will be admitted to dealings. These are the Caridad Copper Company and the Rio Tenido Mines, Limited. The capital of the former is 20,000 shares of 25 fr. each, and of the latter 6,000 shares of 125 fr. each.

Messrs. Schneider & Cie, of the Creusot Steel Works, have bought the Canjuro iron mines in Spain. It is understood that the price paid was 1,400,000 fr., which is considered low.

The foreign merchandise trade of France is reported by the Ministry of Commerce as below:

	1899.	1900.
Imports	Fr. 3,630,374,000	Fr. 3,617,090,000
Exports	3,376,507,000	3,352,714,000
Excess, imports	303,867,000	264,376,000

The decrease of 63,284,000 fr. in imports was chiefly in food, while that of 23,793,000 fr. in exports was chiefly in manufactures.

The report of the Bureau de Travail, just issued, shows that there were, in France in 1899, many strikes of workmen: The number was

740, comprising 176,826 hands in 4,290 establishments, and involving the loss of 3,550,734 days' work, including 1,038,340 days by 35,576 hands who were not on strike. The average for the ten years was only 421 strikes, of 92,448 hands, and 1,502,184 days' labor. There were, in addition, ten lock-outs, due to the application of the new law on compensation to workmen for accidents. The results of the strikes were that 180, comprising 21,131 hands, were successful; 282, with 124,767 hands, male or female, ended by a compromise, and 278, with 30,928 hands, failed; 467 strikes, with 139,561 hands, had for origin questions of wages, 45 were to oppose a reduction and 422 to obtain an increase. Next to questions of wages, the greatest number of the causes of strikes, or about one-fifth of the total, were demands that masters should take back workmen they had dismissed, or dismiss workmen or foremen to whom the hands objected.

Our people have been shouting and demonstrating in honor of M. Krueger. Not everyone has given way to the clamor, however, for I met to-day a stockholder in several Transvaal companies. "Where is the gold commanded from our mines," he asked; "is it in the millions this man has sent to Europe? He is a hero who thinks more of a full pocket than of an honorable end to his career. Leonidas become Lacenaire."

It is hardly safe to talk thus just now, but some of us think so. Azote.

DIVIDENDS.

NAME OF COMPANY.	Latest Dividend.			Total to date.
	Date.	Per share.	Total.	
†Acacia, Colo.	Dec. 15	\$.01	\$15,000	\$45,000
†Am. Sheet Steel, pf.	Jan. 15	1.75	.....	.....
Am. Steel & Wire, com.	Jan. 2	1.75	875,000	2,625,000
†Am. Steel & Wire, pf.	Jan. 2	1.75	7,000	6,300,000
†Bunker Hill & Sull.	Dec. 4	.07	21,000	1,053,000
Calumet & Hecla,	Dec. 23	20.00	2,000,000	73,850,000
Colo. Fuel & Iron, pf.	Dec. 20	8.00	180,000	1,160,000
†Crucible Steel, pf.	Dec. 29	1.75	426,991	426,991
†Daly-West, Utah,	Dec. 15	.25	37,500	607,500
Delaware & Hudson,	Dec. 15	1.25	437,500	.....
†Dominion Coal, pf. N.S.	Jan. 1	4.00	120,000	.....
†Elkton Co., Colo.	Dec. 20	.03	75,000	979,461
Hocking Valley, pf.	Jan. 16	2.00	254,508	.....
†Homestake, S. Dak.	Dec. 26	.50	105,000	9,403,750
†Homestake Oil, Cal.	Dec. 1	.25	2,500	23,000
Iron Silver, Colo.	Dec. 20	.10	50,000	2,550,000
Maryland Coal, pf.	Dec. 31	3.00	58,550	640,800
†Nat'l Lead, pf.	Dec. 15	1.75	260,820	10,579,280
†National Steel, pf.	Dec. 31	1.75	472,500	3,307,500
†N. Y. & Hon. Rosario	Dec. 15	.40	60,000	1,415,000
†Republic, I. & S. pf.	Jan. 2	1.75	355,371	2,132,225
†Sloss-Sheff'd S. & L. pf.	Jan. 2	1.75	114,000	456,000
Standard Oil of N. J.	Dec. 15	10.00	9,750,000	73,125,000
Tamarack, Mich.	Dec. 23	10.00	600,000	7,290,000

* Monthly. † Quarterly. § Extra.

ASSESSMENTS.

NAME OF COMPANY.	Loca-tion.	No.	Delinq.	Sale.	Amt.
Alta	Nev.	66	Dec. 6	Dec. 27	.05
Andes	Nev.	52	Dec. 14	Jan. 4	.05
Best & Belcher	Nev.	72	Dec. 7	Dec. 23	.15
Brunswick Con.	Cal.	15	Dec. 26	Jan. 28	.03
Bunker Hill	Utah	.....	Dec. 6	Dec. 22	0.44
California	Cal.	.....	Jan. 7	.....	.02
Caledonia	Nev.	49	Dec. 18	Jan. 8	.15
Centennial	Mich.	.....	Apr. 12	.....	2.00
Chollar	Nev.	53	Dec. 6	Dec. 27	.10
Christmas	Utah	7	Dec. 13	Jan. 15	0.004
Con. Imperial	Nev.	46	Dec. 23	Jan. 23	.01
Crown Point	Nev.	80	Nov. 30	Dec. 21	.05
Crusader Con.	Utah	2	Dec. 10	Dec. 31	0.004
El Rey	Utah	2	Dec. 4	Dec. 21	.03
Eutonia	Utah	4	Dec. 10	Dec. 28	0.005
Four Aces	Utah	.....	Jan. 4	.....	.02
Golden Star	Cal.	.....	Jan. 2	.....	0.14
Gonyon	Utah	.....	Dec. 1	Jan. 2	0.004
Hilda Gravel	Cal.	.....	Dec. 22	.....	.01
Home	Cal.	.....	Dec. 24	.....	.05
Ingot	Utah	.....	Jan. 4	.....	.01
Larkin	Cal.	8	Dec. 1	Dec. 24	.02
Little Chief	Utah	5	Dec. 26	Jan. 14	.01
Louise S.	Utah	.....	Jan. 6	Feb. 5	.01
Mexican	Nev.	65	Dec. 18	Jan. 8	.15
New Erie	Utah	.....	Dec. 6	.....	0.004
Omaha Con.	Cal.	.....	Dec. 22	.....	.50
Overman	Nev.	6	Dec. 11	Dec. 31	.05
Savage	Nev.	102	Dec. 21	Jan. 11	.10
Sharp	Utah	2	Jan. 3	Jan. 23	0.004
Shoebridge Bonanza ..	Utah	6	Dec. 5	Dec. 21	.008
Silver Bow	Utah	.....	Jan. 10	Jan. 30	0.004
Tetro	Utah	16	Dec. 17	Jan. 5	.01
Texas	Cal.	.....	Dec. 18	.....	.10
Union Con.	Nev.	60	Dec. 5	Dec. 26	.15
Valco	Utah	4	Nov. 22	Dec. 15	.05
Yellow Jacket	Nev.	.....	Nov. 6	Dec. 19	.10

ANNUAL MEETINGS.

Name of Co.	Locat'n.	Date.	Place of Meeting.
Am. Steel & W.	U. S.	Feb. 21	71 Broadway, N. Y.
Andes	Nev.	Dec. 18	San Francisco, Cal.
Cripple C. Colum.	Colo.	Dec. 17	Colo. Springs, Colo.
Enola	Colo.	Dec. 29	Colo. Springs, Colo.
Gould & Curry	Nev.	Dec. 17	San Francisco, Cal.
†Holmes	Nev.	Dec. 19	San Francisco, Cal.
Kennedy	Cal.	Dec. 17	San Francisco, Cal.
Little Bessie	Colo.	Dec. 18	Colo. Springs, Colo.
Maria A.	Colo.	Dec. 30	Colo. Springs, Colo.
Princess	Colo.	Dec. 26	Colo. Springs, Colo.
Providence	Utah.	Jan. 4	Salt Lake City, Utah
†Sterling W. Lead, Pa.	Pa.	Jan. 15	Pittsburg, Pa.

*Special meeting.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies like Alamo, Anaconda, and various mining stocks with columns for location, par value, and prices for Dec. 7-13.

BOSTON, MASS.

Table of stock quotations for Boston, Mass., listing companies like Adventure Con., Aetna Con., and various mining stocks with columns for location, par value, and prices for Dec. 6-12.

COAL AND INDUSTRIAL STOCKS.

Table of coal and industrial stock quotations, listing companies like Am. Sm. & Ref., Am. S. & W. Co., and various industrial stocks with columns for par value and prices.

PHILADELPHIA, PA.

Table of stock quotations for Philadelphia, Pa., listing companies like Am. Alk., Am. Cement, and various industrial stocks with columns for location, par value, and prices.

SAN FRANCISCO, CAL.

Table of stock quotations for San Francisco, Cal., listing companies like Belcher, Best & Belcher, and various mining stocks with columns for location, par value, and prices.

SALT LAKE CITY, UTAH.

Table of stock quotations for Salt Lake City, Utah, listing companies like Ajax, Bullion-Beck & Co., and various mining stocks with columns for shares, par value, and prices.

CALIFORNIA OIL STOCKS.

Table of California oil stock quotations, listing companies like Blue Goose, Buckhorn, and various oil stocks with columns for no. of shares, par value, and prices.

TORONTO, ONT.

Table of stock quotations for Toronto, Ont., listing companies like Ontario, Golden Star, and various mining stocks with columns for par value and prices.

* Producers' Oil Exchange, San Francisco. Total sales, 67,655 shares.

Total shares sold, 306,880.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.:

Table of stock quotations for Colorado Springs, Colo., listing companies like Acacia, Alamo, Am. Con., Anaconda, Anchor, etc., with columns for Par. val., Dec. 3, Dec. 4, Dec. 5, Dec. 6, Dec. 7, and Sales.

Colorado Springs Mining Stock Exchange. Total sales, 1,732,329 shares.

MONTREAL, CANADA.*

Table of stock quotations for Montreal, Canada, listing companies like Big Three, California, Can. Gold Fields, etc., with columns for Par. val., Week, Dec. 10, and Sales.

* Montreal Stock Exchange. Total sales, 49,012 shares.

MEXICO.

Table of stock quotations for Mexico, listing companies like Durango, Barranon y Cab., Candelaria de Pan., etc., with columns for No. of shares, Last div'd., and Prices.

DENVER, COLO.:

Table of stock quotations for Denver, Colo., listing companies like Acacia, Anaconda, Arg. J., etc., with columns for Par. val., Nov. 24, Nov. 25, Nov. 26, Nov. 27, Nov. 28, Nov. 29, and Sales.

* Official Quotations Denver Stock Exchange. Total sales, 248,000 shares.

SPOKANE, WASH.

Table of stock quotations for Spokane, Wash., listing companies like Crystal, Deer Trail Con., Evening Star, etc., with columns for Par. val., B., A., Sales, and Week Dec. 6.

PARIS.

Table of stock quotations for Paris, listing companies like Acleres de Creusot, Boleo, Briansk, etc., with columns for Country, Product, Capital Stock, Par. val., Latest divs., and Prices.

LONDON

Table of stock quotations for London, listing companies like Alaska-Mexican, Anaconda-Treadwell, De Lamar, etc., with columns for Country, Authorized capital, Par. val., Last dividend, and Quotations.

* Ex-dividend. † Ex-rights.

DIVIDENDS.

GOLD, SILVER, COPPER, ZINC, LEAD AND QUICKSILVER COMPANIES.

Table with columns: Number, Name and Location of Company, Authorized Capital Stock, Shares Issued, Dividends (Paid 1900, Total to Date, Latest), and Name and Location of Company, Authorized Capital Stock, Shares Issued, Dividends (Paid 1900, Total to Date, Latest). Rows include companies like Acacia, Adams, Alameda, etc.

COAL, IRON AND OTHER COMPANIES.

Table with columns: Number, Name and Location of Company, Authorized Capital Stock, Shares Issued, Dividends (Paid 1900, Total to Date, Latest), and Name and Location of Company, Authorized Capital Stock, Shares Issued, Dividends (Paid 1900, Total to Date, Latest). Rows include companies like Alabama Coal & Iron, Am. Agricul. Chem., etc.

This table is corrected up to December 8th. Correspondents are requested to forward changes or additions.

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

Table with multiple columns listing various chemicals and minerals such as Abrasives, Borax, Magnesium, Silver, etc., along with their respective units and prices.

THE RARE ELEMENTS.

Prices given are at makers' works in Germany, unless otherwise noted.

Table listing rare elements such as Barium, Beryllium, Boron, Cadmium, etc., with their units and prices.

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. This table is revised up to Nov. 21. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable. See also Market Reviews