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CONTENTS.

Editorial	435
The Unconsidered Heroes. <i>R. W. Raymond.</i>	436
Market Conditions	436
Mining Dividends in 1902.	436
Substitutes for Hard Coal.	437
Mineral Resources of Turkey—Oil and Asphalt, <i>J. E. Spurr.</i>	438
Chemistry of Barium.	438
River Pollution in Coal Districts.	438
*Ducktown Copper Mining District. <i>S. W. McCallie.</i>	439
Notes on Butte, Mont.	440
The Refining of Canadian Nickel.	441
*The Cumberland Plateau Coal Field. <i>M. S. Duffield.</i>	442
*The Mining and Occurrence of Gold in the Dutch East Indies. <i>S. J. Truscott.</i>	444
Pig Iron Production in Canada.	445
United States Mineral Exports.	446
New Zealand Mines in 1901.	446
Gold Mining in the Nome District. <i>Lewis Garrison.</i>	447
*Black Eagle Mine, Lake of the Woods, Ontario.	448
The Seward Peninsula in Alaska.	448
Recent Decisions	449
Abstracts of Official Reports	450
Books Received	451
Books Reviewed	451
Correspondence	452
Questions and Answers.	452
*A Convenient Grinder for Small Shops.	453
Process of Making Metallic Coke. <i>Oscar Daube.</i>	453
*Patents	454

* Illustrated.

DEPARTMENTS.

Assessments	471
Chemicals: New York and Foreign.	469
Coins, Foreign	470
Dividends	471
Financial Notes	470
Industrial Notes	458
Markets: Coal, United States and Foreign.	466
Iron and Steel.	467
Metals: Gold, Silver, Copper, Tin, Lead, Spelter, Anti- mony, Platinum, Quicksilver, etc.	469, 470
Mining News: United States and Foreign.	459
Mining Stocks	466
Obituaries	457
Personals	457
Schools, Technical	457
Societies	457
Stock Market Review: United States and Foreign.	466
Stock Quotations	471, 472
Trade Catalogue	458

THE ISSUE of \$200,000,000 bonds by the United States Steel Corporation, to replace an equal amount of preferred stock, will be legal according to the decision just filed by the New Jersey Court of Errors and Appeals. The opinion of the court has not yet been filed, so that the grounds of the decision are not yet apparent. Some other litigation is pending, but it is of minor importance, and the main suit was that in which the decision has just been given, reversing that of the lower court, which enjoined the issue.

We have heretofore given our opinion of the policy of replacing stock by obligations carrying a fixed charge and mortgage lien, and we have seen nothing which would change that judgment.



SOME IDEA of the demand for labor in the Transvaal mines is found in a recent report of the Chamber of Mines which shows that at the close of June there were employed in the gold mines 6,727 white men and 29,410 negroes. This was an increase of 2,359 whites and 10,144 negroes over the number reported on January 1; but even in June only about one-third of the milling capacity was employed. To bring the district up to its full capacity a very large increase in the number of workmen—especially of natives—will be needed. Probably less than double the number of white men would be sufficient, but that of negroes must be increased nearly or quite in proportion to the output.

Besides the men in the gold mines there were 235 whites and 4,942 negroes employed in the coal mines. These numbers need to be largely increased also.



THE REPORTED combination of the British iron-makers to maintain prices with especial reference to the export trade has been denied by all the parties who are especially mentioned in connection with the business. We cannot say that the report appeared very probable in itself, in view of the usual methods followed in the British trade, though it seemed possible that the larger houses might have reached some agreement to make the best terms possible on the present influx of orders from this side of the water. In view of the explicit statements made, however, the whole matter may be dismissed. In the meantime the British trade seems to be dependent almost entirely upon the American orders, which have been coming in very freely in the last few weeks and have served to support the markets at a time when the tendency of the home demand was downwards rather than otherwise. The recent orders included not only pig iron and steel billets, but also some finished material, chiefly ship plates and rails, the latter for the Pacific Coast. In the nature of things this rush of business cannot be more than temporary, and probably it will be a few months only before our own works are able to take care of the business offered. Our British friends, however, are making the best of the business while it lasts, as they might naturally be expected to do.



ALTHOUGH THE price for zinc ore at Joplin, Mo., continues high, the miners are grumbling because it is not higher, or rather because it does not bear the proper proportion to the price for spelter; and it is said that the Missouri & Kansas Zinc Miners' Association proposes again to undertake to bring the smelters to terms. We applaud the efforts of the miners to get all they can for their product, but we

suggest the advisability of giving a more careful consideration to the nature of the proposed movement than has been given to those of the past, which have been failures and fiascoes. The number of producers in the Joplin District is so large that it is extremely difficult to organize united action, but even if a concerted effort can be agreed upon it will amount to nothing if the demands made on the smelters are more than they can possibly accede to. The smelters are indeed having an inning at present and they might be compelled to forego some of their profit, but if pinched too hard they would simply withdraw from the market, just as they have under previous attempts. The miners and the smelters each have their turn, as market conditions fluctuate, but in view of the competition among the smelters during the last two years, which has put out of use almost all of the old coal-fired plants, unable to stand the pace, it does not appear to us that the miners can have had very much the worst of it.



WITH THE stocks of anthracite in the Eastern cities almost exhausted and the only supply from Pennsylvania a comparatively unimportant quantity of small coal of the washeries, the continuance of the coal strike is leading to some interesting developments. Among these are the increased use of bituminous coal, the importation of Welsh anthracite, and the greater employment of kerosene, coal gas and coke for domestic purposes. In New England there is more or less talk of utilizing the extensive deposits of peat, of which there is said to be in Massachusetts alone something like 125 square miles, averaging 6 feet in thickness, widely distributed over the State. Some enterprising promoters have already taken advantage of the opportunity to advertise companies for the manufacture of peat briquettes, or certain patent fuels based on peat. A more tangible development of local interest is the increased demand and greatly enhanced price for coke, with which the Boston market is supplied by the New England Gas and Coke Company; it is selling now for \$7.50 per ton. Most of the various expedients to make good the woeful deficiency of anthracite are probably of only ephemeral character, but the inroads which the bituminous coal producers have the opportunity to make in the hard coal trade, and are taking perforce the full advantage of, will be more serious to the anthracite industry after this unfortunate labor difficulty is settled.



THE COMPLETION of the new smelting works of the Federal Lead Company, at Alton, Ill., will afford a new market for lead ore which will be of great importance to the mines of Missouri, especially those of the southeastern part of the State. The older mines in that section have their own smelting plants, but the newer producers have not provided themselves with such an equipment and have had to ship a good deal of their ore so far east as Pittsburg, Pa., and Newark, N. J., the public smelting works at St. Louis not having had sufficient capacity to take all of the output. The freight rate on lead in concentrates and lead in pigs from the Flat River District to St. Louis being about the same there should be considerable economy in smelting the concentrates in the vicinity of the latter point instead of at the mines, inasmuch as the carriage on coal, coke and iron flux is saved, while moreover the more central location makes it possible to secure a variety of ores which can be compounded into a more economical

mixture for smelting. The Federal Lead Company itself owns important mines at Flat River, which have been simply undergoing development pending the erection of the smelting plant at Alton, and these will not begin to swell the lead output of Southeastern Missouri, while some of the other mines that are already producing will enjoy the advantage of the new market for ore. This will tend to increase the production of the district, which has remarkable resources of ore and very favorable conditions for its exploitation, as we have often pointed out.



THE LEAD mining district of Southeastern Missouri was for a long time untroubled by labor difficulties; in fact up to two or three years ago such a thing as a strike was unknown in the history of the district. During the last two or three years, however, some difficulties have arisen and disturbed the former smooth and easy conditions. The first of these was an actual shortage in the labor supply, an inability of the mine managers to secure men enough to make the increased production of which the mines were capable and the situation in the lead market justified. Great pains were taken by some of the new mining companies to bring into the district men from the outside, but the newcomers were not most kindly received and the expedient was not entirely a success. The present feeling of unrest in the district arises from the eight-hour law, which was enacted in Missouri not long ago. This law has never been seriously considered, inasmuch as there is grave doubt as to its constitutionality on the ground that it is a species of class legislation. Recently, however, the miners at Fredericktown have raised the point and it will not very likely be brought before the courts for a decision. We believe the mine owners are willing to concede the men an eight-hour day at wages proportionate to those of the present ten-hour day, or under some system of piece work, which will not increase the cost of labor in production, but as usual the men do not want piece work or any less wages per day than they get at present; they want simply the present ten hours pay for eight hours of work.



NOTWITHSTANDING the large tonnage which has already been put in hand for the Lake trade, shipbuilders at the Lake ports report a number of new orders. The *Cleveland Marine Review* notes the placing with Lake shipyards within the past 10 days of an order for eight large freight steamers. The American Shipbuilding Company has on the stocks at its different yards 35 vessels, having a total capacity of 160,000 tons, now under construction. Notwithstanding the large capacity of the yards it will be impossible to complete delivery of the larger of these vessels before July or August next, although some of them will be out in time to take part in next season's trade. It is noticeable that the new ships show some reaction in the minds of the Lake ship owners. The very large boats, of which a great deal was said two years ago, do not seem to have met the requirements of the trade as well as those of smaller size. Seven of the steamers for which orders have just been given are typical vessels, and show that the medium dimensions seem by general agreement to be acceptable as best fitted for the business. These vessels are 436 feet over all, 416 feet keel, 50-foot beam and 28 feet depth, the carrying capacity being estimated at 6,500 gross tons. The engines are triple-expansion, with cylinders of 22, 35 and 58 inch diameter and a stroke of 40 inches. The addition to the Great Lake fleet during the past two years has been very large, and doubtless before the close of next season the carrying capacity of the vessels afloat on the lakes will be not less than double what it was three years ago.

THE UNCONSIDERED HEROES.

It is somewhat surprising that the orators of sentiment, in and out of the pulpit, have not recognized, in connection with the anthracite strike, the representatives of courage and loyalty whom they might fairly be expected to signalize and praise as worthy examples of heroism. Certainly religious and ethical teachers can discharge no higher function than such a recognition, in the concrete, of the virtues they are accustomed to recommend in the abstract. I beg, therefore, to call the attention of the clergy and the philanthropists to three classes of men, who deserve, but have not received, their sympathetic admiration and support.

1. I beg to mention the men who still presume to believe that it is their right to work, if they choose to do so, and who dumbly ask to be protected in that right. I estimate that there are at present, from 15,000 to 20,000 of these men in the anthracite regions. Curiously enough, while all other parties to the conflict have been abundantly in evidence, little or nothing has been heard from this class. Now and then there has been frenzied outcry from a wife (sometimes, alas! from a widow, with helpless children); but the "scabs" attend to business, and say nothing. Occasionally, we learn that one of them is trying to earn the interest on a mortgage, and to save his home; or that one has a dependent family, which he stakes his life to support. Is it not amazing that these men hold fast, in the face of violence and murder, to the duties which their untutored minds consider paramount? And is it not more amazing that bishops and clergymen and the apostles of "gush" generally, have no word of encouragement for them?

2. There is another class, the neglect of which, I feel, perhaps, still more keenly, because, in my time, I have been a member of it. I refer to the mining engineers and superintendents, who are trying to do their duty, at the risk of their lives, to the employers who have entrusted to them the care of property. The universal loyalty of these men is marvelous. But they get no praise from the representatives of religion and reform.

3. I may mention, as a third class of the meritorious, but unacknowledged heroes of this conflict, the private operators and the officers of corporations, who have stood so calmly, yet so firmly, for liberty and law, under a storm of misrepresentation and abuse, coming largely from quarters in which a saner judgment might have been expected. If American institutions and ideas are to be saved from the attacks of reckless selfishness and the concessions of sentimental folly, these men will deserve the credit of that momentous rescue.

R. W. RAYMOND.



MARKET CONDITIONS.

Iron and Steel.—The iron market shows but little change from last week. The furnaces in the middle West have had some relief from the delay in the deliveries of coke and production is showing some gain. There is considerable apprehension, however, that further delay may be experienced when the rolling stock on the road becomes absorbed in the heavy movement of the grain and other material which is handled during the coming month or two. There is little to be said with regard to new business. Most of the large producers being practically out of the market for the time during which the consumers are making contracts. The pressure for early deliveries is somewhat less. Finished material continues to come in at fair rate, and less complaints are heard about the quality. The imports of pig iron and steel billets are given in another column.

Copper.—The copper market remains quiet, and there is no material change in conditions.

Other Metals.—Tin continues somewhat dull, and prices do not seem to improve. The probable arrangement of the difficulty between the American Tin-Plate Company and the Amalgamated Association will have a favorable effect upon this trade.

Lead continues quiet, with a large and constant consumption, and prices unchanged. There has been talk for some time and announcements have been made of the formation of a new concern to be known as the National Lead Company, with a capital of \$60,000,000. It is impossible, however, to obtain the details of this combination fully, and it may be some little time before the final announcements are made. It is understood, however, that it will include a number of leading manufacturers using lead, such as Tatham Brothers & Company, the Raymond Lead Company, of Chicago; the Hoyt, the Markle Company, of St. Louis, and a number of other concerns. There are also included several large manufacturers of white lead. The new combination will be controlled by parties who are largely interested in the American Smelting and Refining Company, and will thus combine the interests of the leading producer of lead in this country with those of the chief consumer in such a way that a strong combination will be formed. One of the most important results of such a combination is pointed out in another column.

Spelter continues strong, with little change in demand or prices. The Joplin ore market also continues strong, and the current price of ore is about \$35 per ton of 60 per cent ore.

Silver continues dull and depressed, with no especial change to be reported. Advices from India are better so far as the crops are concerned, and some improvement in the demand on Indian account may be looked for later on.

Coal.—The Western coal markets continue to be embarrassed by transportation conditions. The Lake shippers are practically tied up, getting not more than half the coal they need. The dealers in Chicago and other large cities are taking up supplies of the better grades of soft coal to an extent which has disturbed local trading materially. Their object, of course, is to make up for the shortage of anthracite and secure themselves against the winter.

The seaboard bituminous market shows little change, except that demand and prices are increasing.

In the anthracite region violence is on the increase, and stringent measures seem inevitable. All sorts of plans continue to be discussed to end the strike, but nothing has been done in a practical way.

President Roosevelt has announced his intention of inviting the leading coal operators and the representatives of the Union. The President, of course, has no legal authority to intervene directly, but it is hoped that his position and influence may lead to the submission of some practical plan for ending the strike. Public opinion in the East is now aroused in view of the approach of cold weather and the probability of a coal famine. This fact may help the President in his effort to bring about an understanding.



MINING DIVIDENDS IN 1902.

Judging from reports received from American mining and metallurgical companies the dividend payments this year will be somewhat less than 1901, owing to two reasons. First: The fall in market prices of copper and silver, which has compelled some of the biggest mining companies to reduce their dividends. Second: The consolidation of profit-paying mines in Colorado, Utah and South Dakota, which has not only lessened the number of companies making regular payments, but in some instances has cut the dividend rate to conform with

the increased capital stock, and also to defray the extra expense in developing certain of the constituent properties.

During the nine months ending September 30 the dividend disbursements of 147 American mining and metallurgical companies amounted to the large total of \$116,351,207, separated as follows:

Producing—	Number of Companies.	Dividends Paid.
Gold, silver, lead.....	67	\$10,797,181
Copper	12	8,951,481
Zinc	2	742,544
Quicksilver	5	116,500
Total	86	\$20,607,706
Iron and steel.....	16	48,750,107
Petroleum and gas.....	25	36,528,368
Coal and coke.....	12	6,766,541
Chemicals, etc.	8	3,698,485
Total.....	61	\$95,743,501
Grand total	147	\$116,351,207

The bulk of these dividends has been contributed by the big industrial combinations which control a large part of the output of raw material used in their manufactures.

The best paying quarter was from January to March, when dividends aggregated \$48,029,673. The smallest disbursements were made between July and September, amounting to only \$30,885,936. This difference is partly accounted for by the heavy division of profits in the first quarter from 1901 earnings; while the payments in the third quarter were much affected by the smaller earnings in the first six months of this year. There have been a number of new companies added to the list.

Of the \$10,797,181 paid, nearly one-half has been contributed in small monthly or quarterly declarations by Colorado, Utah and other mines. The largest individual payers were the American Smelting and Refining Company, \$2,625,000 on its preferred stock; Silver King Mine, of Utah, \$900,000; Homestake, of South Dakota, \$894,000, and Daly West, of Utah, \$720,000. The three last named companies make regular monthly payments.

The copper mines paid \$8,951,481. The Montana and Michigan companies continue to pay the bulk of these dividends, although there have been some declarations from California and Arizona by properties which are largely controlled in Great Britain. The leading individual payers in the copper group were Amalgamated \$3,077,757 which has come from stock in other companies; Calumet & Hecla, \$2,000,000, and the Arizona Copper Company, \$1,114,799.

The quicksilver dividends have been declared by California mines controlled in Boston and New York.

The zinc payments were made principally by the New Jersey Zinc Company.

In the industrial section the United States Steel Corporation paid \$42,443,181 and the Standard Oil Company, \$33,950,000, which together makes nearly 80 per cent of the total reported by all industrial companies. Numerous small oil companies in California and Texas have paid regular dividends.

There have also been declared \$1,541,020 by 19 Mexican mining companies; \$135,000 by 1 Central American mine, controlled in New York; 1 South American mine, owned in Great Britain, and \$932,044 by 10 Canadian properties.



SUBSTITUTES FOR HARD COAL.

The long-continued cutting off of the supply of anthracite coal does not appear to have checked anywhere the industries which were previously dependent upon it as fuel, although great inconvenience has been experienced and profits have doubtless been diminished in many cases. The pall of black smoke which now hangs over New York, making it look like a Western city, tells the story; soft coal is being

used instead of hard coal. This is manifested also in the rise in prices for soft coal under the greatly increased demand for it. Indeed, the capacity of the producers of bituminous coal appears to be taxed to the utmost; a few days ago the agent of a large eastern coal dealer reported to his principal that it was impossible to purchase a cargo of coal in the Philadelphia market. But although bituminous coal has so largely taken the place of anthracite, the question is often asked what are the small consumers, and especially the householders, doing for their fuel, and what will they do as cold weather approaches and more is required? The Boston *Transcript* presented a few days ago some interesting notes on this phase of the problem in its part of the country and we suppose that much the same expedients have been adopted elsewhere.

The remnants of the stocks of hard coal are kept for the domestic trade and sales to any one person are restricted by increase in the price. Hotels have to use soft coal for their heating, lighting and power systems and get only enough hard coal for their kitchens. All customers who buy coal for use in building operations and the generation of steam were turned over to the bituminous trade long ago. Even for domestic purposes soft coal is being used; the people are learning gradually that it burns well in the range when proper care is taken of the fire, and many have begun to experiment with it. As the *Transcript* remarks, they may never return to hard coal, which is always more expensive, and it is not necessary to go back many years in the history of New England to find that soft coal was a very common article for household use. Illuminating gas finds greatly increased employment as a fuel for culinary purposes, but the great resource appears to be kerosene, the consumption of which has increased enormously. Many new appliances for the improved combustion of that convenient, cheap and powerful fuel have been put on the market and there is said to be a large demand for them, which will doubtless increase as the winter comes on.

One of the concerns which is reaping an advantage from the shortage in the supply of anthracite is the New England Gas and Coke Company, in Boston, although because of previously existing contracts for a large part of its coke output the increase in its income is not what it might otherwise have been. However, the company ought not to have much complaint on that score, since it has contracts for coal supply that have become of a very favorable character through changes in market conditions subsequent to their consummation. At present the company has only about 200 tons of coke per day to offer in the open market and that is eagerly sought for; the demand is greatly in excess of the supply and numerous orders have to be rejected because of inability to fill them.

Although the New England Gas and Coke Company has been a failure as an investment to those who subscribed for its bonds and shares, it is generally regarded that the plant at Everett has been a great technical success. The difficulties of the company have been due apparently to overcapitalization, bad finance and complications arising from its undertakings in the illuminating gas business of Boston. The company is at present in process of reorganization, which will doubtless result in its being put on a sound basis. The increased demand for its coke product which is now being experienced ought to develop to the permanent advantage of the company, inasmuch as many consumers, who have not employed it heretofore but are now anxious to do so because it is the best available fuel, will acquire a knowledge of its merits and the way of burning it, and will be likely to continue to use it after anthracite is again to be had freely.

THE SMELTING TRUST AND THE MINERS.

From time to time complaints are made from the West as to the unfavorable effect of the smelters' consolidation upon the mining industry. Some have gone so far as to characterize the policy of that company as one of confiscation of the mines. That is, we believe, absurd, inasmuch as the welfare of the Smelting Company depends upon the prosperity of the mining industry and there is no reason to suppose that it has any idea of assuming the management of the latter. However, as in most controversies there is generally a certain foundation for each opinion, it may be conceded that there are elements in the situation that may perhaps present sound grounds for complaint; we do not say that they do. At all events the protests of the miners have been given a quasi-official character by the resolution adopted at the International Mining Congress at Butte, Mont., calling on the attorney general to suppress the smelting trust.

The American Smelting and Refining Company has acquired undisputed control of the silver-lead smelting business in the major portion of the United States; it owns all the works except a few on the Atlantic and Pacific coasts. The miners of the most important districts in the Rocky Mountains are practically limited to selling their ore to it and on its own terms. The company avers that it has made fair terms; in fact that it has generally reduced smelting charges. The miners maintain that it has refused to buy certain kinds of ore, especially lead ore, or has made such rates as to restrict the production. This is admitted by the Smelting Company. The reason is obvious. That company has been engaged in the policy of maintaining the price of lead, if not at an exorbitant figure, at least at one that is higher than the average price of the metal during the last ten years. Irrespective of the wisdom of that policy, it may be said that for a long while it put a heavy burden on the company because of the great production of the mines. The increase of the stock in the hands of the company compelled a concession in the price asked for the metal and measures to restrict the production. By virtue of these steps the situation was relieved and lately the miners of the Coeur d'Alene have been allowed to increase their output again. In this connection it must be remembered that the lead production of Missouri has never been under the control of the American Smelting and Refining Company; the miners of those districts have refused to enter into any agreement for the restriction of production, but have participated fully in the benefit of the high price for the metal, while they are able to produce so cheaply that a low price would not check them.

Consequently the whole burden has fallen on the silver-lead districts; if their output has been restricted, they have at the same time realized a higher price for what they have marketed than otherwise they would have been able to do. This may have been to the advantage of some miners; to the disadvantage of others. The ground of complaint on the part of the latter must be that they have been made unwilling partners in the scheme. That, however, is the natural result of any attempt to regulate production, through the monopoly of a manufacturing interest, which does not itself produce the raw material.

Aside from the question of lead ores, the successful prosecution of a smelting business depends upon securing a supply of the various kinds of ore which can be mixed in such a way as to be smelted to the best advantage. If the supply of one kind is in excess, such rates have to be made on it as will compensate for the increased cost of smelting; this will tend to restrict the production of that kind of ore. Substantially the same condition existed

when the smelters were independent, although competition among them often diminished the profit in smelting below what might reasonably have been expected. There is undoubtedly an advantage in the common purchase of the ore supply, leading to an economy in smelting, in which both the smelter and the miners participate. Whether the division is unfair and too much is asked of the miners in the undertaking of the Smelting Company to pay dividends on its huge capitalization, we do not venture to say. The extent to which an increase in the capitalization of an industry is legitimate, because of the economies realizable through consolidation and the elimination of competition, is an exceedingly intricate question. There is less doubt as to the former point than to the latter, involving as it does such broad economic principles. Untrammelled competition with its inevitable succession of booms and crises, its fat times and lean, obeying the rigorous laws of commerce and nature, may not be in the long run the best for the general welfare. The possible great evil in such a concentration of interests as the Smelting Company has effected appears to us to be the power it gives a few men to dictate the policy to many, overriding individual inequalities, destroying freedom of action and increasing the chances of favoritism; and this probably is the chief ground of complaint of the miners against the smelting trust.

MINERAL RESOURCES OF TURKEY.—II.—OIL AND ASPHALT.

By J. E. SPURR.

Oil-fields of considerable extent and of great probable importance are known to occupy the southeastern part of the empire, in which Bagdad is situated. The oil exudes at the surface and collects in little lakelets, and has long been known to the inhabitants, but never has been developed. According to descriptions, the oil bearing strata seem to be loosely consolidated Tertiary rocks.

Two other separate yet adjacent oil fields, where the conditions are very likely much the same, may be mentioned to throw light on this undeveloped Turkish oil field—the oil-fields of Persia near the Turkish frontier and the Russian oil-fields of Baku, also near the Turkish boundary. The Persian fields are little better known than the Turkish, but the Russian field is famous as one of the most important oil districts of the world. In the Persian district oil exudes at the surface in a number of localities, especially near the Persian Gulf. At one locality (Daliki) bore holes have been sunk which encountered up to 630 feet several layers of bitumen, with oil too thick to pump. The boring was then stopped. The indications are such as to suggest a chain of oil fields from the Persian Gulf up to Baku, in Russia.

In Armenia, also, on the south shore of the Black Sea, oil is said to exist and to be a continuation of the Baku field.

On the southwestern coast of Asia Minor, north of Cape Chelidonia, is the famous ancient Chimaera of the Greek stories. Here gases are continually disengaged from fissures and are known to have been burning for 2,800 years at least, for the phenomenon was described by Hesiod before the time of Homer. The writer has not visited the locality. Tshiatcheff, the Russian geologist, states that the gas is emitted from fissures in serpentine (altered igneous rock) intrusive into limestone. It is interesting to note in this connection that burning fountains of gas were long known in the Baku oil field, before the discovery of oil there. There is also on the coast of Albania (east shore of the Adriatic) the locality Polina, near Durezzo, where gas emanates from the summit of a hill, and often accidentally takes fire. The hill is said to be igneous, but the existence at the foot of it of an asphalt spring suggests an organic rather than a volcanic origin for the gas. Petroleum also has been reported from here, and seems to have been exported on a small scale. This hill

was the ancient Apollonia, and here the priestess of the famed Delphic oracle sat and inhaled the fumes of gas till dazed, when her words were regarded as inspired.

It is, therefore, an open question as to whether the escaping gas of the Chimaera (the modern Turkish name is *Yanartash*—"stone that burns") is of organic origin, and indicates oil below, or is volcanic, but the chances are perhaps in favor of the former alternative, especially as the igneous rocks of the locality (altered peridotite) is not one that indicates recent volcanic activity.

Unexploited oil is also reported in the Province of Adrinople, European Turkey.

To sum up, although no explorations have yet been made, there is oil, or the indications of oil, in a number of places in the Turkish Empire. Especially in the general belt which runs southeastward from the eastern part of Armenia, on the Black Sea, down to the Persian Gulf, it seems likely that important oil fields can be developed.

As is perhaps most often the case there seems to be a general connection between petroleum and natural asphalt in the Turkish Empire. Asphalt deposits are known in a number of localities, of which the best known are in Albania, near the Adriatic, and in Palestine.

In Albania asphalt occurs at the foot of the hill of the Delphic oracle, as mentioned above, also in a large bed near Avlona, and other places. This asphalt was mined by the ancients, and is mentioned by Posidonius. The chief producing locality is now Selnitz, which is worked by the Imperial Ottoman Bank. The asphalt is not of the highest quality, bringing about \$13 a ton in Trieste. Asphalt is reported from the Province of Monastir, in European Turkey.

The asphalt in the region of the Dead Sea (Lake Asphalti) has long been noted. There are bituminous springs at Nebi Musa which contain 30 to 40 per cent asphalt.

What is commercially known as the Syrian asphalt is exploited near Hasbaya, in the Province of Damas, by the Civil List of the Sultan. The mineral is hard and of a brilliant luster, with a marked odor. It is of great purity, and is therefore used entirely in the manufacture of varnishes and aniline dyes. It has been chiefly marketed at Trieste, where it is quoted at \$84 per ton, boxed and delivered. The demand is, however, limited, so that the yearly output is only a few hundred tons.

An Anglo-German company, with headquarters in Constantinople, has been formed to work other deposits in Palestine, but so far they have not obtained the concession.

Bituminous schists are found near Beyrouth. Some movement has been made toward working them, and a large trial lot has been sent to England, but so far there has been no real activity.

Dr. Edgar James Banks, formerly American Consul at Bagdad, and now director of the Ur archaeological exploring expedition, states that there are springs of bitumen opposite the town of Nasarieh, Province of Busreh, about 100 miles from the site of Babylon. The deposits are near a navigable river, but are not exploited, save that the material is to a certain extent used by the natives as a cement in building and as a substitute for sealing wax.

CHEMISTRY OF BARIUM.

In Volume X. of *The Mineral Industry* Mr. Edmund H. Miller reviews the work done in the analytical chemistry of barium during 1901. The most important contribution to the literature of the subject is that of C. H. Peters¹, who investigated the precipitation of barium, strontium and calcium as oxalates, and their subsequent determination by indirect titration with potassium permanganate. In order to get sufficiently complete precipitation of strontium oxalate, the volume of the solution should be 100 c.c., and should contain one-fifth 85 per cent alcohol, as this oxalate is soluble in 12,000 parts of

water. For barium oxalate, which is soluble in 2,590 parts of water, one-third of the solution should be alcohol. The conditions for precipitation are as follows: To the barium solution 100 c.c. in volume and containing about 30 per cent alcohol, add an excess of ammonium oxalate and allow to stand overnight; filter on asbestos in a Gooch crucible, wash with water containing 30 per cent alcohol and dry over a flame to expel the alcohol, which would reduce permanganate. The crucible with the precipitate is put in a large beaker, with from 100 to 200 c.c. of water, from 5 to 10 c.c. concentrated hydrochloric acid, and from 0.5 to 1 gram of manganous chloride, and the resulting solution titrated by permanganate at a temperature of from 35 to 40 deg. c. The results given are quite satisfactory, and better than when sulphuric acid is used, as the barium sulphate retains oxalic acid by occlusion. In regard to the precipitation of these oxalates when used as a means of separation from magnesium, the recent article by Prof. Richards² affords very valuable information.

E. Groschuff³ gives the solubility of the different hydrates of barium oxalate and also of the acid oxalate $BaC_2O_4 \cdot H_2C_2O_4 \cdot 2H_2O$.

D. Vitali⁴ describes a method for the recognition of barium compounds in the contents of the stomach to be used in cases of poisoning.

L. Dobbin⁵ calls attention to the very considerable solubility of barium sulphate in solutions of sodium thiosulphate ("hypo"), and suggests this as another source of error in the difficult determination of mixtures of sulphates, sulphites, thiosulphates, etc.

RIVER POLLUTION IN COAL DISTRICTS.

An interesting series of investigation is about to be begun by the Division of Hydrography of the United States Geological Survey, under M. O. Leighton, resident hydrographer, into the effects of coal-mine refuse upon the rivers of the coal region. It has been commonly observed that the streams running close to the anthracite mines of eastern Pennsylvania and other mining localities are heavily charged with sulphur, and that their waters often have a slightly acid reaction; the beds of the streams are also often overlain by heavy deposits of sulphur precipitated from the water.

It is the purpose of the investigations to discover the effects, deleterious or otherwise, upon the rivers which receive the polluted streams. One of the immediate results of the pollution is the driving away of all varieties of fish, which were once abundant in these streams, but a more important consideration is the influence of the sulphur-charged streams on the processes of decomposition of organic matter going on in rivers into which they flow. It is an important question, though at present it seems to be an open one, whether a stream polluted by some sewage is assisted or retarded in its self-purification by the sulphur-polluted tributaries; but there is a possibility which is yet to be demonstrated, that the discharge of mine waste into sewage pollution may have an important chemical influence upon sedimentation, if not an appreciable effect upon the oxidation of organic matter.

On the other hand, the mine refuse, especially such as comes from culm-pile washery, is a troublesome source of pollution. The separation of the coal from the waste is accomplished through the use of enormous quantities of water, which are returned to the streams laden with fine coal-dust. For some distance below the outlets of these washeries the streams have the appearance of liquid stove-polish, and the coal-dust extending for many miles downstream is gradually deposited, in places even filling the channels of the streams. Such water is unfit for household or even for manufacturing uses.

¹*Zeitschrift fuer Anorganische Chemie*, 1901, p. 71.

²*Berichte*, Vol. XXXIV., p. 3313.

³*L'Orosi*, Vol. XXIII., p. 260.

⁴*Journal of the Society of Chemical Industry*, March 30, 1901, p. 218.

⁵*American Journal of Science*, September, 1901, pp. 210-224.

THE DUCKTOWN COPPER MINING DISTRICT.

By S. W. McCallie.

The Ducktown copper mining district is located in the extreme southeastern corner of Tennessee, and in the adjacent portions of Georgia. Topographically considered, the district lies within what is known as the Ducktown Basin, an elevated, eroded plateau, enclosed on three sides by mountains, rising from 500 to 2,000 feet above the general level of the surrounding country. The basin, which has an average elevation of about 1,500 feet above the sea level, is traversed by numerous low, well-rounded ridges, having a northeast-southwest trend, corresponding in direction to the major axis of the basin. Potato, Fightingtown and Brush Creeks, streams of considerable size, together with the Ocoee River, form the drainage system of the district. The Ocoee divides the basin into two nearly equal divisions, one lying to the northwest and the other to the southeast. In escaping from the basin, the river cuts a deep gorge through the main mountain-mass to the west, thus forming a natural outlet for travel to the Valley of East Tennessee.

The first discovery of copper in the Ducktown District was made in 1843 by a gold hunter named Semmons, while panning for gold in a branch near where the Burra-Burra shaft is now located. Crystals of red copper, which were supposed by him to be gold, were here found near the outcropping of the copper vein. Four years subsequent to this date, Weaver, a German miner, discovered the black oxide of copper in the Ducktown District, and shipped 90 casks of the ore to the smelting works near Boston. This ore yielded from 15 to 32 per cent copper, and at once demonstrated the commercial importance of the discovery.

In 1855, eight years after what may be termed the actual discovery of copper, no less than 14 mines were in operation in the Ducktown District, with a monthly output of 807 tons of ore, valued at \$80,000. During the early workings of the mines the greater part of the ores were hauled by wagon to Cleveland, Tenn., the nearest railroad station, 40 miles distant, from whence they were shipped to Swansea, Wales, for treatment. Later furnaces were erected in the district, which reduced the ores to matte, running from 30 to 50 per cent copper. These improvements were soon added to by the erection of refining works and a copper rolling mill, the latter being located at Cleveland, where percussion caps and other munitions of war were manufactured during the war. The Ducktown mining district, thus developed by a natural process of growth, was in a highly prosperous condition in 1863, when mining ceased on account

been carried on continuously and with increasing energy. At present there are two companies operating in the district, namely, the Tennessee Copper Company, and the Ducktown Sulphur, Iron and Copper Company. The latter company operates two

The Tennessee Copper Company, which is a comparatively new organization, now operates three mines, namely, the Burra-Burra, the London, and the Polk County, the first two being located on the western and the other on the eastern copper leads.



mines and has in blast two large Herreshoff furnaces, which reduce the ore to 50 per cent copper matte. Formerly this matte was shipped to the Eastern refineries, but at present it is all purchased by the Tennessee Copper Company and re-smelted

This company has just completed and has in successful operation near McCay very extensive smelting and refining works. The plant consists of two 500-ton furnaces, a number of converters and a refiner, the latter having a capacity of 25 tons of refined copper per day. At present the refinery has not been put in operation, and only one of the 500-ton furnaces is now in blast. When the entire plant is started up it will be able to treat about 1,000 tons of refined copper per month. The total monthly output of the two companies now operating in the district is about 600 tons of copper, running 99.4 per cent pure. These companies at present give employment to about 1,800 men, the majority of whom are natives, who by long training have become quite efficient miners.

Geology.—The detailed geology of the Ducktown District has never been worked out. The area is included in a belt of metamorphic rocks referred by Hayes and Keith to the Ocoee series, which is of pre-Cambrian age. The prevailing rocks of the district are mica-schists and gneisses, which, according to Prof. J. F. Kemp, are altered sediments. The former, Kemp thinks, were originally highly aluminous shales, while the latter were slightly aluminous sandstones. During the process of the metamorphism of the region, these rocks were much folded and contorted, and they all now dip at a high angle, usually to the southeast. In addition to the gneisses and schists, there are two other rocks of the district which require special notice. The most extensive of these rocks, and one which is of special geological interest, is a fine-grained, dark-gray quartz diorite, forming an outcropping 100 feet or more in width. One of the best exposures of this rock, which is unquestionably of igneous origin, is to be seen on the



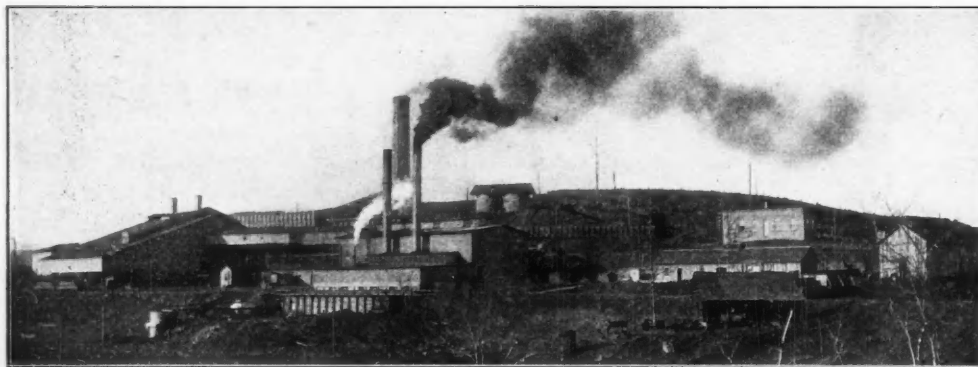
BURRA-BURRA MINE, DUCKTOWN, TENN.

of the Civil War. Scarcely had the terms of peace been signed when the mines were again opened and worked with great energy until 1878. After the last named date the mines lay idle until 1891, the year in which the Atlanta, Knoxville & Northern Railroad was completed to that point.

Since 1891 mining in the Ducktown District has

at the smelting and refining works near McCay. The two mines operated by the Ducktown Sulphur, Iron and Copper Company are both located on the eastern ore lead, and are known as the Mary and the Callaway mines. This company is also making arrangements to open a third mine, known as the East Tennessee, located on the western copper lead.

public road between the Tennessee Copper Company's smelter and McCay. South of the Ocoee River this rock becomes more abundant, and is always found to run parallel with the copper veins. The diorite is usually massive, but at some points it has a somewhat schistose structure. The other rock above referred to often occurs in the walls of the ore bodies. It is a light-gray quartzose rock, speckled with innumerable small crystals of hornblende, and occasionally with minute brownish garnets. The rock occurs generally as thin layers in the gneisses, but sometimes it is found in the form of nearly rounded masses or balls a foot or less in diameter, in the



SMELTER AND REFINING WORKS, TENNESSEE COPPER COMPANY.

more massive layers of gneiss. The mode of occurrence of this rock in places would indicate that it is an eruptive. However, it is most probably an altered sediment.

The Ore-bodies.—The ore-bodies of the Ducktown District may be said to occur in three different nearly parallel veins or leads, varying from $\frac{1}{2}$ to $\frac{3}{4}$ mile apart. The individual veins or leads are not continuous throughout their entire course, but usually consist of a number of huge lens-shaped ore masses, having their longer axes parallel and approximately in the same plain. The trend of the ore-bodies is northeast and southwest, corresponding to the strike of the gneisses and schists. They vary greatly in thickness. At some points they have a thickness of less than 12 feet, while at others they attain a thickness of more than 300 feet. Some of these lenticular ore bodies, as shown by the gossan outcroppings, are 1,000 feet or more in length. The deepest workings in the district are about 600 feet. These workings show that the size of the ore-bodies vary but little in depth. South of the Ocoee River the ore-bodies do not seem to be so large as those north of the river, but the general character of the veins is unchanged. Because these ore-bodies correspond in strike and dip to the country rock, it was formerly supposed that they were bedded veins, but the more recent investigations of Hendrich, Weed and Kemp go to show that the deposits are replacements of some ferro-magnesian or calcareous rock along crushing or faulting plains. It has been suggested that the ore-bodies are probably replacements of diorite dikes, such as are to be seen in the vicinity of McCay and at numerous points further to the south.

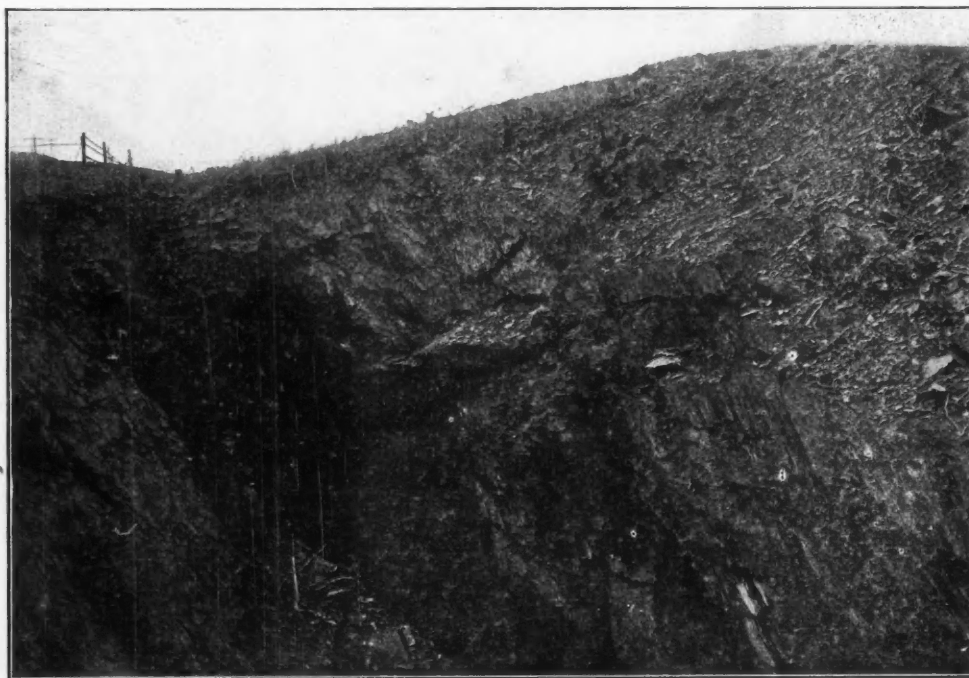
The Character of the Ore.—The ores vary somewhat in the different veins, and also at different points in the same vein. Generally speaking the ores may be described as a massive pyrrhotite impregnated with chalcopyrite and pyrite. The latter mineral in places, as at the Isabella Mine, predominates, and forms the greater part of the ore-body. The most abundant gangue minerals are quartz, amphibole, garnets, galena and calcite. These gangue minerals all seem to be older than the chalcopyrite, which often binds together their broken fragments. During the early workings of the mines, large quantities of black oxides and carbonates were found at the water level, but such ores are now practically exhausted, and the source of the copper at present is confined to the unaltered sulphides. These ores, which appear to be practically inexhaustible, run, when roasted, on an average from 2 to 4 per cent copper. Consid-

erable bodies of these unaltered sulphides, as in the case of the East Tennessee Mine, have been known to run as high as 17 per cent copper, but such ores are rarely ever found in large quantities.

Gossan.—That part of the ore-body lying above water level in most cases has been oxidized and changed into a somewhat porous, brownish or reddish iron ore. These ores' always run low in sulphur and phosphorus and high in iron, thus making a very desirable quality of iron ore. The mining of the gossan ores in the Ducktown District has now become quite an industry, giving employment during the greater part of the year to from 75 to 150 men.

The iron ores are shipped mainly to Middleboro, Ky., and Bristol, Tenn., where they are used for mixing with the red fossil ores.

The Waste.—One of the most valuable constituents of the copper ores of the Ducktown District is at present a total loss. This waste is the sulphur which in the sulphides often constitutes from 20 to 30 per cent of the ore. To eliminate the sulphur, the ore is



WALLING OF COPPER VEIN, LONDON MINE, DUCKTOWN, TENN.

roasted in open heaps, thus setting it free in the atmosphere as sulphurous fumes, which have destroyed the forests and vegetation in general for miles around, leaving the country a desolate, barren waste. The amount of sulphur lost annually in the district is enormous, and far exceeds in value all of the other products of the mines. Attempts have been made to save the sulphur from some of these high grade pyrrhotiferous ores by concentrating the sulphides, but so far no practical method has been devised.

COAL MINE ACCIDENTS IN FRANCE.—A recent official report gives the number of fatal accidents per 1,000 employees in the coal mines of

France, for a series of years, as follows: 1896, 1.30; 1897, 1.07; 1898, 1.08; 1899, 1.35; 1900, 1.42. The increase in 1899 and 1900 was due to several explosions of gas, notably those at the Plat-de-Gier and the Aniche collieries.

NOTES ON BUTTE, MONTANA.

BY AN OCCASIONAL CORRESPONDENT.

The effect of the various law suits between the Amalgamated Copper Company and the Montana Ore Purchasing Company is now becoming an important factor, influencing to a large extent the production of the Butte copper mines. As a result of these lawsuits and countersuits the Nipper, Schweizer and Parnell mines of the Montana Ore Purchasing Company are now idle. The Minnie Healey, which yielded a daily output of 800 tons of ore, nearly half of it first-class ore, while it was worked by Mr. Heinze's representative, has been closed down by order of the courts, pending a determination of ownership and apex rights. The Cora Mine, another Montana Ore Purchasing property, is enjoined from working the three southerly veins of the claim. The Snohomish and Tramway mines, owned jointly by the Butte & Boston Company and the Montana Ore Purchasing Company, are being worked by a receiver appointed by the courts. On the other hand, the Boston & Montana Company can not work the ore-bodies which it has followed down from their surface levels in the Leonard Mine, one of the richest and largest of its properties, and it is also enjoined from working the largest veins in the Pennsylvania Mine. The Butte & Boston property known as the Michael-Davit is also idle. The long-delayed suit between the owners of the Speculator Mine and the Bell Mine of the Anaconda Company has been amicably settled out of court, but the Speculator Mine has recently been shut down by order of the court,

in a suit brought by ex-Senator Lee Mantell for a part ownership and accounting. The Colusa-Parrott Mine, the subject of a sensational lawsuit determined in favor of the Anaconda Company in a suit brought a year and a half ago, has now been sold by Senator Clark to the Amalgamated Company. Up to the present time the other Clark properties have been free from legal attack, and the Syndicate, Bell-Diamond and Anaconda groups of mines have continued working without interference from the courts.

Among the recent changes not due in any way to litigation should be mentioned the Blue Jay Mine, of the Butte & Boston Company, which has been permanently shut down and will not be reopened. The Colusa-Parrott Mine is also permanently shut

down. Both these properties can be more conveniently worked from adjacent claims.

The Number Six Original shaft of the Parrott Company, which was opened up last autumn, is now shut down again. The Little Mina Mine has not been reopened, and so far as can be learned neither of the last two properties will be opened in the future.

The most important new territory opened up within the last few months has been the West-Stewart Mine of Senator Clark. This shaft has been sunk to a depth of 1,000 feet on the west end of the Stewart claim, and it opened up magnificent ore-bodies of high-grade ore. Connections have been made between it and the Original and Old Stewart mines, both of which are Clark properties.

Within the last month the old Clear Grit shaft has been cleaned out and put in shape for working. The shaft is 500 feet deep, and shows fine bodies of copper ore at its deeper levels. The larger shafts of the camp have all been deepened during the last year, and much new ground opened up. The most notable examples are the High Ore, Diamond and Green Mountain shafts, all of which are 2,200 feet deep, and in each of which good ore is now being produced from this level.

In the Mountain Consolidated Mine a new vein showing copper glance has been found on the 2,100 foot level. The Neversweat shaft is now 2,000 feet deep, and the ore-body seen on this level is larger

as the ownership of the water used in the concentrator, as well as the mill-site and the tailings-site, were all in litigation, no attempt has thus far been made to rebuild the concentrator, but the company has leased the Katy mill, at Basin, 28 miles to the north, and will treat its concentrating ores there.

Among the improvements made in the camp during the last year the most important were those planned by Mr. D. W. Brunton, chief consulting engineer of the Anaconda Company. It is planned to pump all the water from the many Amalgamated properties at the High Ore Mill, and drain tunnels will be driven from the 2,200-foot station of this mine to all the other properties, and the pump will handle the water to an outlet tunnel 300 feet below the collar of the shaft.

At the Rarus Mine Mr. George H. Robinson, the chief consulting engineer of the Montana Ore Purchasing Company, has introduced a number of new ideas which have effected important economies. All the ore is now screened as it comes from the mine—even the low-grade concentrating ore passes over these screens. As a result of the brittleness of the copper minerals these screenings are of high grade, and can be sent at once to the mechanical roasters, materially lessening the amount of the tonnage formerly sent to the concentrator. The old Rarus shaft is now filled with scrap iron, and the mine waters passing down the shaft precipitate their copper con-

approach westward, and come together in depth, and in the Cora have yielded large bodies of glance ore. A brilliant future for this property has been predicted by Mr. Robinson.

On the same plateau, to the westward, near the Lexington Mine, the Ravin Mine has been purchased by Mr. John Birken, who has extracted approximately \$150,000 worth of ore in the last year. This is a silver-gold property, but has yielded quite high-grade ore. With this exception the silver properties of the district have been worked on a very small scale for several years past.

At the Alice Mine lessees have been at work extracting ores from the old levels near the surface. The shaft house was recently burned, but the superintendent, Mr. Buzzo, announces his intention to rebuild at an early date. The mill, which has been idle for some time, will not be reopened unless the experiments now being made to utilize the ores high in zinc and low in silver prove that a cheap process will treat these ores at a profit.

At the Lexington Mine about 12 men are still at work pushing development work on the veins which carry bunches of copper pyrite. This mine has yielded between 2,500 and 4,000 tons a year of copper ore running about 4 per cent in copper and carrying good values in gold and silver. There is little prospect of this mine being reopened as a silver property, but the present work pays expenses and keeps the property in good order.

The sensational discoveries of gold ore in the Metz properties near Butte have proved disappointing, as the values found at the 50 foot level have not been so large at a greater depth.

East of the main copper area the many shafts being sunk on the flat and on the foothills of the main range have proved disappointing, and with two exceptions the work has been stopped. At the Sinbad development work is still in progress. At the Farrel shaft, under the superintendence of Mr. Donald Gillis, the shaft has penetrated to the solid granite beneath the wash, and large veins of good grade ore have been encountered. Despite this fact, however, the future of this eastern area does not appear to be a brilliant one, as the development work has not been remunerative, although somewhat extensively carried on by the Butte & Boston and other large companies.



MINING IRON ORE (COPPER GOSSAN) DUCKTOWN, TENN.

and richer than it was on the 1,800 and 1,600 foot levels. The Anaconda shaft is now 1,900 feet deep, and will be sunk to the 2,500 foot level during the ensuing year. The St. Lawrence shaft is still at 1,600 feet, and sinking is not now in progress. The Mountain View shaft is 1,400 feet deep, but the ledge has not been cut at this depth. In the Minnie Healey Mine the ore-bodies have been worked on the 1,000 foot level, but the shaft is now 1,200 feet deep, which is the same depth as that of the Leonard Mine and the West Colusa Mine, both in the same locality. In the Rarus Mine, a Montana Ore Purchasing property, large ore-bodies of copper glance and enargite have been cut on two veins which occur in the northwest part of the claim beneath the Rarus fault, on the 1,000 and 1,200 foot levels. The 1,300 foot level of this mine has cut several veins, but has not yet reached these new discoveries, as development work was delayed by flooding, as a result of an accident to the pumps in July.

The present output of all the mines is about 10,000 tons of ore a day, 4,500 tons going to the new smelter at Anaconda, 2,500 tons going to Great Falls and the Boston & Montana smelter, 1,200 tons to the Montana Ore Purchasing smelter, and the balance being handled by the Butte Reduction Works, Senator Clark's property.

The recent burning of the Montana Ore Purchasing concentrator temporarily crippled that company, and

tents on the way, one man being kept constantly busy shoveling up the cement copper from the bottom and adding scrap iron from above. The mine water thus freed from its copper contents is acid, and this is neutralized by quicklime before pumping, thus materially saving the corrosion of the bronze lining of the pumps. As the pipes are wood-lined they are not affected.

Experiments have also been made by the other companies upon this use of lime to neutralize the acid of the mine waters, but the copper contents are also thrown down by the quicklime, if they have not already been removed, and the resulting precipitate of gelatinous gypsum is extremely difficult to settle, and it is almost impossible to dry it sufficiently to use in the furnaces.

At the Montana Ore Purchasing Company's smelter, Mr. Robinson has also introduced the use of basic lining next to the shell of the bessemer converter. The usual silica lining is placed inside of this, and as a result the converters last one-third longer, owing to the uneven corrosion of the silica by the charge.

At the Cora Mine there are now two large working shafts, the easterly one 1,200 feet deep, the westerly one 1,000 feet deep. This property lies on the edge of the plateau above Butte and on the border of the copper area, the Wild Bill vein and the North Gray Ridge vein passing into the property. These veins

THE REFINING OF CANADIAN NICKEL.

By Our Special Correspondent.

The unsettled question of refining the nickel of the Sudbury mines in Canada, instead of sending it to the United States, is cropping up again, and will likely be agitated in Parliament and the press this coming winter with the view of having the matter decided one way or the other. Four years ago, in the session of 1898, the Dominion Government took power to put an export duty on nickel ores and matte by order in council at any time, and two years later the Ontario Government passed almost a similar act. But neither government has done anything in this direction yet, except on paper, and the constitutional right of the Ontario Legislature to pass such an act is to be determined by the courts.

To go back a little, when the Canadian Copper Company obtained its charter from the Dominion Government at the start, it was distinctly stipulated in the charter that the ore should be treated in Canada and not elsewhere. But the then government did not apparently know the difference between smelting and refining, and so the proper terms were not used in the compulsory clause. There is no doubt, however, as to the clear understanding between the Government and the company that the nickel should be refined in Canada. The corrected draft of the charter and the subsequent correspondence with the head officials of the company establish this fact. In any case, a very large majority of the people of Canada, and especially of Ontario, want to see the timber, mineral and other resources of the country manufactured as far as possible into finished products at home, instead of being shipped

abroad mainly in the form of raw material, as has been done to such an extent in the past. This policy has lately received a new and powerful impetus from a most unexpected source. The Hon. J. Israel Tarte, Minister of Public Works in the Dominion Government, has been touring the provinces of Ontario and Quebec for the past two months and publicly advocating a "readjustment of the tariff on strictly patriotic lines."

A Canadian patent holds good for 18 years, but has to be worked or put in practical use within three years from the date of issue. The time may be extended on cause shown, and often is, in fact. This condition is more honored in the breach than in the observance. The government fees are low enough, and may be paid either all down at once or in three separate instalments, each payment covering a period of six years. If the fees are not paid when due, the patent lapses, and can only be renewed by a special act of Parliament. There is no other way.

The Orford patent for refining nickel was taken out in Canada in 1901 or thereabouts, but for some reason or other the second instalment of the fees was not paid in time, and as no special act of Parliament has been passed to renew this patent, it has lapsed, and hence the Thompson process, as it is called, can be used by any other company in Canada for refining nickel. Last year, before the formation of the nickel trust, the Orford people took out a charter in Ontario for a new company and also purchased a site for a plant—or, as was supposed at the time, for a nickel refinery—on the Spanish River, a few miles below Massey Station; but nothing has so far been done towards the erection of any kind of works there.

Many suggestions have been made and discussed on the platform and in the press during the past 10 years as to the proper solution of this nickel question, but none of them seems to meet fully all the peculiar circumstances of the case. Some parties have proposed a government bonus for the refining of nickel, the same as is now being paid for the production of iron and steel. Others, again, contend that the main trouble is the high price at which nickel has been maintained for years back, thus preventing its more general use in the metallurgical industries.

But the true solution of the whole matter may be very simple when found. A local mining man claims to have discovered a process by which both matte and refined nickel can be made at far less cost than is possible by any other method. Be that as it may, one thing is beyond dispute, that public sentiment in Canada is strongly in favor of having the nickel refined in the country, and this popular desire has almost become a fixed idea.

THE ABSOLUTE ZERO.—In the course of his address as president of the British Association for the Advancement of Science, at Belfast, Ireland, September 10, Prof. James Dewar stated that by the evaporation of solid hydrogen under the air pump a temperature of about 13° C. above the absolute zero (— 273° C.) can be reached, but at that point further progress is barred, and although it may be possible to attain a lower temperature, it is improbable that the absolute zero itself will ever be reached.

PRESSED-STEEL CARS IN GERMANY.—Under date of September 1, 1902, United States Consul B. H. Warner, of Leipzig, says: "The directors of the Prussian State railroads have recommended to the Minister of Public Works that a bill be introduced into the Prussian Parliament, providing for the construction of pressed-steel coal cars of 20 tons carrying capacity. The minister, after giving the matter careful consideration, has suggested that the proposals be somewhat modified, and, as soon as the bill is amended, it is believed that the Prussian State railroads will place pressed-steel cars in commission."

THE CUMBERLAND PLATEAU COAL-FIELD.

By M. S. DUFFIELD, DETROIT, MICH.

There are few known valuable coal-fields East of the Mississippi, that have been allowed to lie idle from lack of capital for proper development. But such has until recently been the case with the Cumberland Plateau in North Central Tennessee and Southern Kentucky.

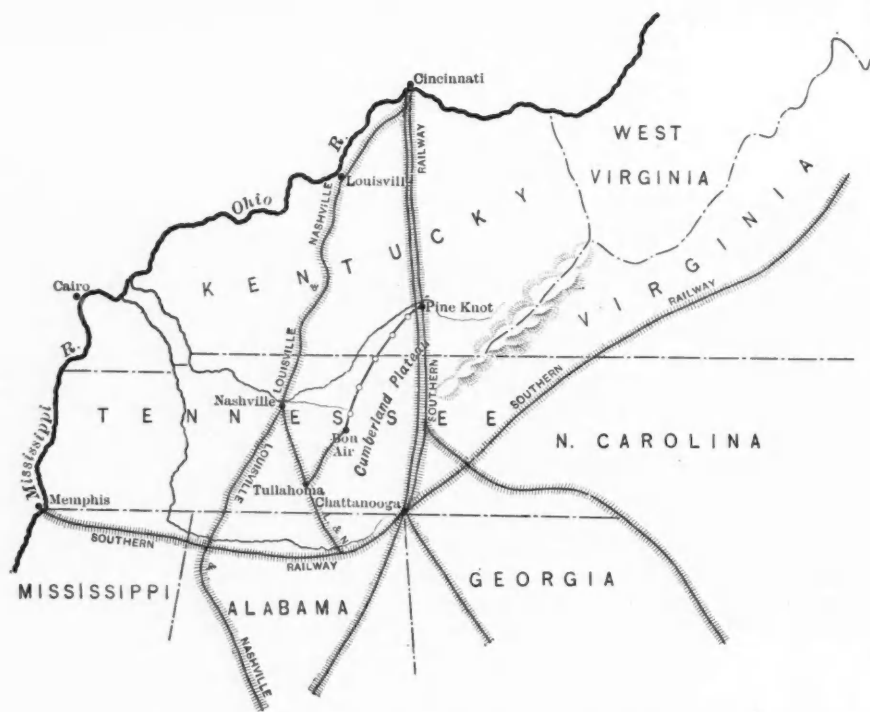
This coal-field has long been known. Before the war the old settlers and mountaineers ran scow-loads of coal from the outcrops down the Obey to the Cumberland River, with the spring floods. During the campaigns of the Army of the Cumberland through Kentucky and across Tennessee to Chattanooga, many officers in that army became interested in the district, and many names familiar in the history of those campaigns are recognizable in old titles. A great many drill holes have been put down over a considerable area; the country has been repeatedly examined by geologists and mining engineers; and it has long been certain that here was an immense coal-field. Why then until this late day has capital never been induced to take hold of it and prosecute its development?

It is a peculiar situation, and yet only what could be expected under the circumstances. A glance at

areas are mostly calciferous shales and sandstones lying on a bed of carboniferous limestone. The numerous creeks that make up the forks of the Cumberland and Tennessee rivers have cut across the dip of the sandstones into the underlying limestone, making deep V-shaped valleys often 800 to 1,000 feet below the summit of the table-land. From the bluffs of the western margin can be seen far below in the valleys and coves the cultivated limestone areas.

This rugged character of the western border of the coal-field has made it seem more inaccessible than it really is, and has in many cases given the district a bad name. And yet, as a matter of fact, it is just here that are offered the best grades of coal, the most stable widths of vein, and the best opportunities for economic mining. In fact Scott, Pickett, Wayne, Whitley, Fentress, Overton and Morgan counties may be called the very heart of the field.

The Coal Measures vary from 300 to 500 feet in thickness and are made up of alternating beds of sandstones, shales and coal, resting conformably on the mountain limestone. They form everywhere along the western margin of the plateau the upper caps of the table-land. In the face of the bluffs can be seen, in clear out-crops, the approximately hori-



MAP SHOWING LOCATION OF CUMBERLAND PLATEAU.

the map will make it clear. The two great railroad systems between which the plateau lies—the Louisville & Nashville on the west and the Southern on the east—during almost the entire period of their organization and growth, have been rivals. The best routes to reach the heart of the district meant terminals in each system, and the Tennessee and Cumberland rivers, which surround this plateau, placed difficulties in the way of road-making, which in themselves were not at all insurmountable, but which, taken in combination with the larger policies of these two railroad systems, were formidable.

Within the last six months, however, the two systems have been harmonized, and short roads are under survey to reach the heart of the district.

The Cumberland Plateau proper stretches west of the Unaka and Cumberland mountains. It includes what is known as the Wilderness on the Kentucky State line, and as the Cumberland Plateau in Tennessee. In these two States this table-land is an important topographical feature embracing an area of about 8,000 square miles. It is the coal-field of Kentucky and Tennessee, and is an extension of the great Appalachian coal-field which extends from Pennsylvania to the middle of Alabama.

The geology of this table-land is simple. The

zonal strata which make up the body of the table-land. One of the sandstones is a conglomerate, containing small, well-washed, flinty pebbles, and is a sure guide in the location of the main veins. From this conglomerate the most extensive coal-bearing formation of the table-land has been named the Lee Conglomerate Sandstone.

The limestone underlying the coal formation has a mean thickness of 500 feet. Chalybeate springs issue from this limestone at many points along the western base of the mountain; and the formation is often cavernous. In many instances in drilling for coal subterranean drainage has been discovered, and it has been considered practicable to drain mines by boring through to the cavernous limestone. The depth of the Obey and Wolf valleys ensures the continuance of such drainage (when encountered), well back towards the eastern margin of the coal-field.

The principal coal-bed, known throughout the district as the "Main-coal," occurs in the lower deposits of the Lee formation and is found at its proper horizon over many square miles of Overton, Fentress, Pickett and Scott counties. Varying widths of slates and fireclays accompany the main coal horizon.

The occurrence of the coal veins in relation to the different formations and their position in those form-

ations is very interesting from a scientific point of view. A brief review of the cycles of sedimentation will make the facts clearer. The rocks are all of sedimentary origin. The sea which deposited them covered most of the Appalachian province and the Mississippi basin. The Cumberland Plateau was near its eastern margin, along which coarse sandstones and shales were deposited in early Cambrian time. Between the Upper and Lower Silurian, these sandstones were lifted above the sea, thus completing the first great cycle. After this came a second depression, during which Devonian black shale was accumulated on the sandstones, now worn down almost to base level. Devonian sandstones were also deposited in this period. The third cycle began with a depression, during which the Carboniferous limestone accumulated; this in turn was lifted into shallow water and, in some places, even above the sea. Upon it were deposited, in shallow water and swamps, the sandstones, shales and coal-beds of the Carboniferous.

The accompanying section illustrates the structure and formation of the plateau. The district lies mostly on the southeastern side of the great Cincinnati Arch, and its structure consists of light southeasterly dips.

In the extreme eastern part of the plateau, at elevations from 2,000 to 2,600 feet, occur the Scott shale

margin. An upper coal is mined in this formation on the Emory River and around Helenwood. But the most important coals occur in the shales occupying the lower strata of the formation. North, west and south of Jamestown, Fentress County, these coal seams are exposed in many places by the deep coves of the Obey River, whose side streams are destined to be the center of mining operations in the next few years. To the westward below the Lee conglomerate lie the Pennington shale, the Newman sandstone and Normandy limestone, which are barren of coal.

South of the Jamestown openings, the lower conglomerate of the Lee formation develops into a topographically important stratum, called the Bon Air conglomerate lintel, from its prominence near Bon Air, White County, Tenn. At Bon Air and Monterey mines have been opened on a heavy seam occurring below the Bon Air conglomerate at the base of an underlying stratum of shale. This coal seems to be identical with the Sewanee coal which is so prominent in the extreme south of the plateau and along its eastern border as far north as Rockwood, Tenn.

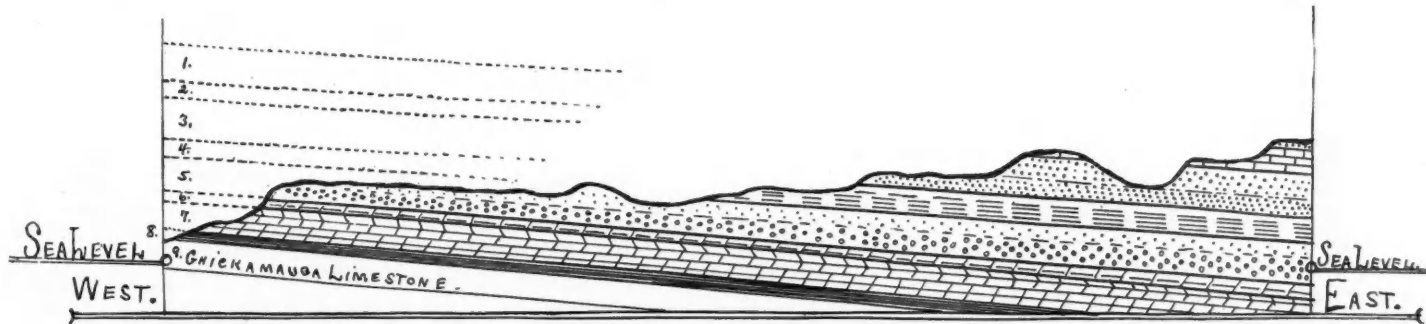
The coals are all bituminous, and along the south and east borders of the district are excellent coking coals. Structurally speaking, it seems to be those coals in the lower part of the dip of the strata of each formation that afford the best coking material.

The great development in the district is going to come from a road now under survey from Bon Air (present terminus of a spur from the Louisville & Nashville system), northward to Whitley County, Kentucky. This line will pass through White, Putnam, Overton, Fentress, Pickett and Scott counties in Tennessee, and Wayne and Whitley counties in Kentucky. This will pass near enough to the western margin of the plateau to induce immediate operations in the Lee formation of Overton, Fentress, Pickett and Scott counties where the natural facilities for economic mining are so abundant. There will be few difficulties in constructing a railroad along this route, the conglomerate affording flat ridges and scarcely any grades.

Besides coal, on the sandy soil of the sandstone ridges and in the hollows there are extensive forests of oak, chestnut and yellow pine. Also just west of the plateau in the Obey Valley, an oil-field has been slowly developing in the Pennington shale.

The days of the mountain lawyer and county land shark are about at an end and titles are becoming fairly stable. There has been a great confusion of titles the past 30 years owing to the lack of a State survey, and the inexact method of defining State grants; and this confusion in a measure accounts for the tardy exploitation of the district by capital.

With the opening of new mines in the Lee forma



GEOLOGICAL SECTION OF CUMBERLAND PLATEAU.

- 1. ANDERSON SANDSTONE.
- 2. SCOTT SHALE.
- 3. WARTBURG SANDSTONE.

- 4. BRUCEVILLE SHALE.
- 5. LEE CONGLOMERATE SANDSTONE.
- 6. PENNINGTON SHALE.

- 7. NEWMAN LIMESTONE.
- 8. CHATTANOOGA SHALE.
- 9. CHICKAMAUGA LIMESTONE.

and Anderson sandstone formations; named from the counties in which they are most general. The Anderson sandstone is the upper. They are both argillaceous and contain 8 or 10 thin coal seams, which grade into carbonaceous shale and are too slight to be of any value. Underlying the Scott shale occurs the Wartburg sandstone, named from the town of Wartburg, Morgan County. This formation contains sandy shales, but is mostly sandstone. It contains five seams of coal, one of which has long been mined at Glen Mary on the Cincinnati Southern. Below this Wartburg formation and further westward occurs the Bruceville shale. This formation thins toward the north and west and reaches its greatest thickness in the southeast. It contains many workable seams of coal between its beds of sandstone. At Helenwood, Montgomery, Wartburg and other smaller places, mines have been opened in this formation. The workable seams occur close above the underlying formation. Next to the Bruceville shale comes the formation most important economically in the entire coal-field. It is also the most extensive in area. It is the Lee conglomerate sandstone, named from Lee County, Virginia. This formation includes the basal portion of the Pennsylvania series, or the middle part of the Pottsville. The major portion of the Cumberland plateau lies in its areas. It consists mostly of massive sandstones, including many thin beds of shale, and, in its lower portion, two layers of conglomerate. These conglomerates, with their texture of quartz pebbles, are the cliff-making sandstones which have had so much to do with the western topography of the tableland. The formation varies in thickness, and dies out, or rather has been eroded away, at the western

However, the coals in the Wartburg sandstone and the Bruceville shale are locally coking coals. The coals in the Lee formation are excellent block coals. The openings about Jamestown, along the east fork of the Obey River, have demonstrated that there is very little sign of slacking upon exposure. In places the higher veins of the Lee formation have a workable width and are good quality cannel. The main veins of the three productive formations have stable widths and the mines thus far opened on them have good records.

It will be readily seen that this plateau affords an extensive coal-field. The mines that so far are opened are more or less accidental. The Cincinnati Southern Railway, in going over the plateau, naturally sought the least broken country, and avoided water courses where the formations are cut down and the coal exposed.

Helenwood, Glenmary, Wartburg and Rockwood happened to combine mining advantages with proximity to the railroad. And yet there is certainly room for much more exploitation of the Wartburg sandstone and the Bruceville shale than these operations represent. The Tennessee Central Railway has opened within the last year a route from Nashville to Knoxville. The road passes across the northern edge of the Bon Air conglomerate lintel, and is unfortunate in that it affords no convenient access to the known productive formations. Spurs are, however, being built from it into the Lee formation and mines opened. Taking all the facts into consideration, these two roads were located rather unfortunately for the good of the district. The Cincinnati Southern's mileage over the plateau is almost wholly in the Bruceville shale.

tion, the plateau will rapidly build up into a prosperous mining district; and owing to its hardness and non-slacking qualities the coal will mostly find an outlet to Atlantic or Gulf ports for export trade and steamer use.

SOLUTION OF MINERAL PHOSPHATES.—Mr. Clinton Paul Townsend, in the *Electrical World and Engineer* says: "Messrs. Wiborgh and Palmer, of Stockholm, Sweden, patent a process for converting the insoluble or mineral phosphates into the so-called reverted salts—a process so rational and withal so simple that it is somewhat remarkable that it has not been before suggested. There are three distinct phosphates of calcium, the mono-, di- and tri-basic salts, the first being soluble in water, the second in certain neutral salt solutions, and the third in acids. Agricultural value decreases in the order named. The present process contemplates the conversion of the tri-basic or insoluble phosphate into the di-basic salt, and consists merely in placing the ground rock in the anode compartment of a diaphragmed cell, containing as an electrolyte a solution of any salt, as the nitrate of an alkali metal, whose acid radical forms a soluble combination with calcium. The phosphate dissolves in the acid liberated at the anode, to be precipitated in the di-basic form by the base which is simultaneously formed at the cathode; the reactions involve the regeneration of the electrolyte. In commenting a few months ago upon the Cheeseman process for the solution of natural phosphates, it was remarked that the efficiency of the method would be increased if the solvent effect were limited to the immediate region of the anode; this is, in fact, the principle of the present method."

THE MINING AND OCCURRENCE OF GOLD IN THE DUTCH EAST INDIES.*

By S. J. TRUSCOTT.

During the last five years or so, a good many English and American mining engineers have proceeded to the Dutch East Indies and have worked there. Before this period a large amount of tin and petroleum mining had been done without causing undue excitement, but the idea of mining for gold grew so rapidly that to the Europeans there it became an engrossing excitement. Exploration work was undertaken upon the islands of Sumatra, Borneo and Celebes. The records of early travelers showed that in their times gold was much used and valued by the natives for ornament and for hoarded deposit, and the later explorers had confirmed the existence of native workings, and of the actual currency of alluvial gold in some places.

In Sumatra the Dutch Government itself had, in the very early days, worked upon an occurrence of gold-bearing mineral ore; in West Borneo, the occurrence of alluvial gold had been amply demonstrated by the amount of work done, and by the gold obtained by the Chinese, with whom the Government were in prolonged conflict; and in Celebes the native workings in the northern peninsula were established as a fact again and again.

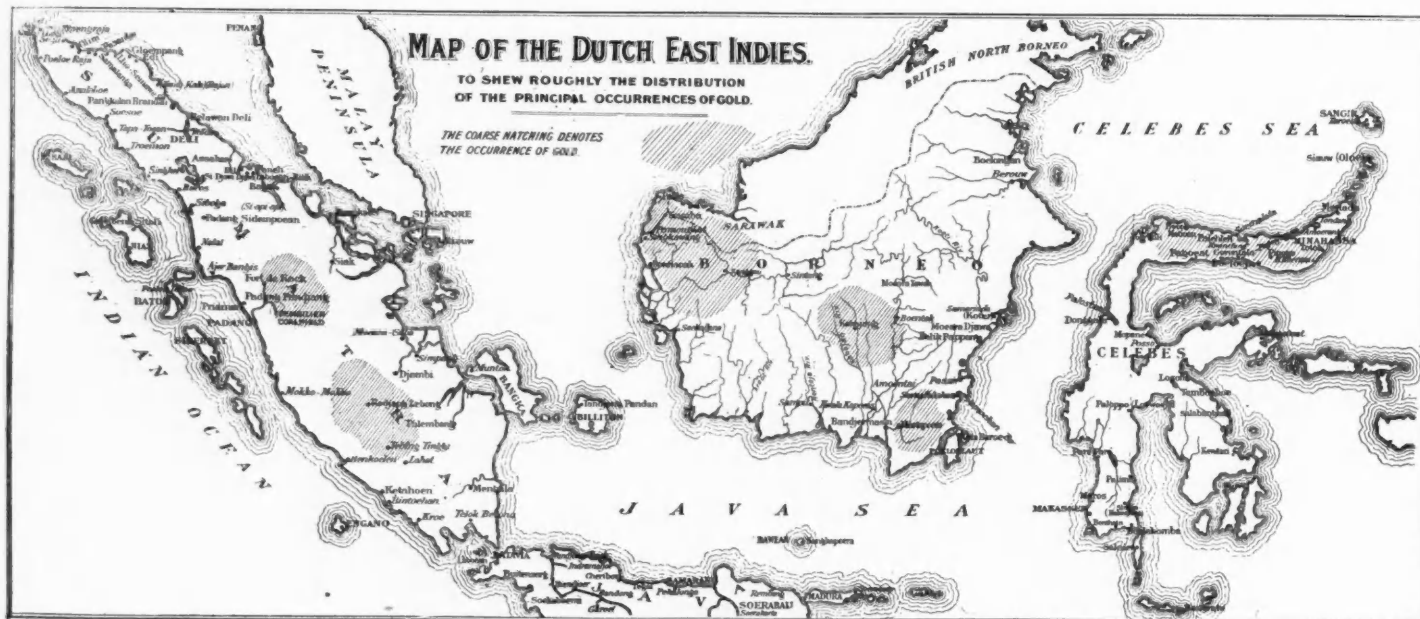
In all these indications there was sufficient to justify the further exploration of the reputable places.

The occurrence of the ore is very curious. The outcrop is seen lying uncovered for a height of over 100 feet upon the steep face of a hill, at an angle of about 50°; this hill, which forms the footwall, is of porphyrite or altered andesite. Below the surface the reef is steeper, dipping about 70°, so that it would appear as if it had inclined over on the surface consequent upon the decomposition of the footwall; the hanging wall on the hillside has either been completely eroded away or it was cleared away by the natives, centuries ago, in order that they might prosecute their mining work upon the reef. It has been noted in the last annual report of this mine, that the value of the reef increases from the most exposed part to that which is better protected, as though the upper parts had suffered in value by reason of their exposure.

The ore is generally a hard close-grained amorphous silica, with very little quartz proper. With it there are occurrences in places of a breccia of black silicified slate and more generally it is accompanied by an amount of colespar. The gold occurs so finely disseminated throughout the mass, that it is rarely visible even with the help of a microscope. This gold would appear to exist in two forms, one as free gold, found principally in the richer seams, and the other as auriferous silver, carrying gold in the proportion of one of gold to ten of silver. It will probably be found that in depth this silver exists as sulphide connected

Redjang Lebong, at Lebong Soelit, and at a third unnamed place, lie practically in an east and west line, which to embrace all three of them is about 12 miles in length. This rectitude in general position is rendered more noticeable by a rectitude in detail. All the three reefs extend in length along the line which joins the three places, as though they were portions of one and the same reef, which, however, is most improbable, as it has never been suggested. These three mines form together a district of great prospective value.

Further to the north, towards the center of the island, there are other areas around Fort de Kock and Soepajang which have also been prospected during the last years, but no reef of any value has so far been discovered in that neighborhood. The country rock to which the gold has there been followed consists of porphyrites and slates, but the quartz veins found in them contain only traces of gold. Some of these veins are very large, so that possibly they are altered zones of the country rock, or possibly they are dikes and not veins or reefs in the simple senses of those words. In some cases, the small pits which have been sunk in the river beds by the natives for auriferous alluvial wash, can be followed right up to these reefs or zones, but are not seen upstream beyond them, showing plainly that in those particular cases they are the sources of the gold for which the natives worked.



The quest was taken up eagerly, so that within the last five years, from 80 to 100 companies have been formed, and about \$2,500,000 has been spent upon exploration work alone, in addition to that which has been spent upon the actual exploitation of those mines which have reached that stage.

Sumatra.—The gold mining in this island now centers around the mine Redjang Lebong, which is in the southwest part of the island, about five days' traveling by bullock wagon from the town of Bencoolen, on the west coast. From this town a road having a total length of about 100 miles leads to the mine; more than one-half of this road was made years ago by the Government, and the remainder has been made by the company; the highest point along it is 3,100 feet above the sea, and the altitude of the mine is about 1,300 feet. Transport is difficult and expensive, and during the wet season, which lasts about four months, it is almost impracticable.

The discovery of old mining works by Europeans was first made in the year 1896, and this was quickly followed by proper development, so that very early in the year 1898 the ore-body exposed had been well surveyed, and a trial crushing had been made. The reef was then given a known extent of 1,000 feet in length and 17 feet in width, and its value by assay was 2 ounces of gold and from 7 to 10 ounces silver per ton.

*Abstract of paper read before the Institution of Mining and Metallurgy, London.

with pyrites. It has been suggested that the gold may ultimately be found to exist in connection with tellurium; but an analysis, made by Johnson, Mathey & Co., of bullion from the mine, is remarkable for the amount of selenium, and gives no suggestion about the occurrence of tellurium.

About 5 miles due west, in a straight line from Redjang Lebong, there is another and very similar occurrence of a gold-bearing reef, at a mine called Lebong Soelit. At this place there are four outcrops of reef which have been worked upon by the natives, and which are in such relative positions to one another that one faulted reef, of which these outcrops are parts, is suggested. The total length of reef so indicated is about 2,000 feet, over which the average width is not less than 8 feet, and the average value about 1 ounce. The ore has all the appearance and characteristics of that from Redjang Lebong.

The communication of this mine, Lebong Soelit, with the coast, is by means of a light tramway, about 28 miles long, to a river which is navigable from that point to the coast by steam launch and lighters. This means of communication will probably be eventually used for Redjang Lebong, and it will then be the trunk way for the district, as it would be also in position to serve a third discovery of similar ore, which lies about 7 miles due west, and in a straight line from Lebong Soelit.

These three occurrences of gold-bearing ore at

Borneo.—In this island there are three principal auriferous districts, one in West Borneo, centered around Samhas; another, in Central Borneo, at the sources of the Kehajang and Kapuas rivers, and the third in the southeastern corner of the island. These districts are situated in a wide stretch of country which crosses the island from northwest to southeast and outside of which not much gold has been found.

In West Borneo, a very large amount of work has been done in the neighborhood of Samhas and in the direction of Sarawak upon alluvial and detrital deposits, by the Chinese, so that exploration work was here undertaken with a lively hope of finding payable ore deposits. In this there has been, so far, considerable disappointment, the result of the work being to show that the best statement about the occurrence of gold in parent rock is, that it is found in veins or vein-like impregnation in the old slates and eruptive rocks. The old slates are generally considered to be Devonian, but with them there are some sandstones and conglomerates which resemble, in some respects, the beds of the first stage of the Eocene period. The eruptive rocks are varieties of granite and porphyrite; the valleys have been worn in those places where these rocks were much decomposed, leaving the hills occupied by the harder and more holo-crystalline varieties. The old slates are broken and traversed by dikes of the eruptive rock upon the masses of which they also lie, showing that

they were in position before the intrusion of the eruptive rocks beneath them. In addition, both formations are traversed by dikes of a much more recent date, and in the district there are some massive occurrences of this later igneous rock, though these do not occur in the immediate neighborhood of the areas which have been more actively prospected lately.

In the igneous rock the occurrence of gold appears to be limited to the traverse of veins or dikes, or to the contact with the slate formation; similarly, the occurrence in the slate is generally near the igneous rock. There are no large, regular quartz veins; those which are found generally give out after they are followed for a short length, although in the center of their extent they may have appeared very promising, both in appearance and value. This has been the case both on the Loemar concession in eruptive rock, and in the Benkajang concession in the old slates.

In addition to the veins there are vein-like impregnations, which probably follow lines of fracture or contact. These occur both in the slate and in the eruptive rock, as zones which have auriferous pyrites disseminated with small quartz veins throughout their extent. It is probable that the greater part of the alluvial gold that has been obtained was originally derived from these zones of impregnation.

It may be mentioned that the greater portion of the alluvial deposits are upon a bed-rock of decomposed eruptive rock, and that there are occurrences which would almost indicate that there are local zones where an impregnation with gold would appear to have been a primary condition of the igneous rock; and, indeed, it may generally be said of this district that the presence of eruptive rock upon the ground is more necessary to the occurrence of gold than the presence of the old slates.

The surface-deposits upon the hill slopes have yielded a good deal of alluvial gold, most of which is not water-worn, so that it cannot have traveled far. Yet, the exploration for gold reefs in this part of Borneo by Europeans has not resulted in any definite success.

In addition to ordinary iron pyrites, various other sulphides, such as chalcopyrite, galena, or zinc-blende have been found in connection with gold ore, and in Sarawak there was a special occurrence of the sulphide of antimony with gold in it.

There are large areas of alluvial ground where the value of the deposits is rich when compared with the general average of such deposits in other countries where such mining has been carried on successfully, and it may be that these deposits will provide profitable exploitation. In such areas there is usually a lot of water, so that the work will have to be done by dredges, and this, together with the difficulties of transport, communication, and of climate, will make any such exploitation a big undertaking.

The Central Borneo auriferous district is found around the sources of the rivers Kahajang and Kapuas, which flow south into the Java Sea. The present interest there is centered around the Kahajang Mine, which is situated about 7 miles from the right bank in the upper part of that river. Communication is by steam launch for about 200 miles upstream from the sea, and then by boats for the remaining distance, which is not great.

The occurrence at this mine is that of gold-bearing quartz veins in a rock locally known as granite, at the contact of the granite with an old slate formation. It is more than probable that the granite upheaved the slate and that alone, and near the junction between the two, fractures were formed which were filled up with auriferous quartz. At the junction, both rocks bear evidence of having been fractured and afterwards altered by deposition of silica and iron pyrites, and a good deal of the quartz in the reefs would appear to be a replacement of the original granite by silica, for much of it is friable as though the silicification had not been complete enough to produce a solid and compact mass. The deposition of pyrites was also marked, especially in the slates which were traversed in places by small quartz veins accompanied by galena, pyrites and zinc-blende,

these sulphides being also impregnated in the rock. In one place quite close to the granite, such an amount of silica had also been introduced into the slates that a solid mass was formed, inside of which the pyrites and other sulphides were entirely protected from oxidation, so that these slates on surface retained their dark unoxidized color.

In the Kehajang Mine two reefs are being worked which run parallel in a north and south direction, and at a distance of 212 feet from one another. The rock between them, though principally crystalline rock, has some schistose bands within it which will probably have resulted from pressure upon those of its parts which contained but little quartz. Between the two reef other bands of quartz occur, but they are poor and do not contain more gold than the whole extent of rock which from one reef to the other contains an appreciable, though very small amount.

The more easterly of the two reefs is quite close to the junction of the granite with the slate. It is about 3½ feet wide, and its average assay value is about 1 ounce of gold per ton and 12 ounces of silver. It has been followed for some hundreds of feet, and at its northern end it is entirely on the eruptive rock. The greater part of the gold which it carries is coarse and free, and the sulphurets vary from ½ per cent. near the surface to 4½ per cent. underground. These sulphurets assay about 1½ ounces of gold per ton, and they consist chiefly of iron pyrites with a little copper pyrites. It is in the slate country that sulphides of lead and zinc are more noticeable.

The second reef is well within the granite country; it is 1 foot and more in width, and though its extent has not been proved for any great length, yet it has a very high assay value, probably averaging over 5 ounces per ton. The percentage of sulphurets in it is higher than that of the other reef, though the value of them when the free gold has been taken out, remains much the same.

In the neighborhood of this mine there are two other occurrences of gold which are worthy of note; one is that of detrital gold upon a granite country rock, and the other is that of a quartz reef in a slate country. The first is about 1½ miles away, at a place where, the slate having been crossed, the granite occurs again; here there are many old native pits sunk down to the top of the granite, which is weathering *in situ*; these pits are almost confined to the granite as but few of them are found on the slate country which is close by. The granite is quite similar to that occurring at the Kehajang Mine; being really a quartz porphyrite, it consists almost entirely of quartz and a felsitic mass, but the quartz is not rounded.

The second occurrence is that of a quartz reef about 8 feet wide, and assaying about ½ ounce of gold per ton. It is in a slate country, but it is anticipated that this rock will soon give place to the granite which is close by.

In a southerly direction, and about 5 or 6 miles away in a straight line, there is a formation very similar to that at the Kehajang Mine. It consists of gold-bearing quartz veins near the junction of slates and granite. The slates are black and yellow, and they lie upon the granite, which has, in places, a pisolitic structure. This prospect has not yet been further opened up, but its good value has been recognized.

There is a wide distribution of alluvial gold in the district, and in every case it can be traced to have its origin in an igneous rock, which is very variable in its character, but which is generally either a felsite or a porphyrite, and which sometimes is found as dikes, and at other times as masses.

As igneous rock, with its impregnated dikes and zones, is much developed in this district, the riverbeds contain the gold which has been loosened as the rock disintegrated, and for this gold the natives have worked for many years. During the dry season the lowest portions of every sandy spur are the scenes of native gold washing, and their results make it likely that to work with dredges would be profitable, the only drawback being the number of snags in the river bed.

It was the report of these alluvial washings which first drew the attention of Europeans, and though it is practically certain that the greater part of the gold so occurring results from the impregnation of gold in a parent rock in such minute quantities that it could never be payable, yet gold, richly concentrated, in the form of quartz veins, has been found, and the prospect of finding similar veins is good. It is anticipated that when this district is opened up it will be a regular gold-producing country, though at present it is in such an out of the way place that it cannot be developed with any speed.

In the southeastern portion of the island of Borneo there are occurrences of alluvial gold of small extent, and there are evidences that this gold has its source in extended occurrences of an easily decomposed igneous rock, which appears on surface in a soft weathered state, and which is probably porphyrite or altered andesite.

(To be continued.)

PIG IRON PRODUCTION IN CANADA.

The American Iron and Steel Association has received direct from the manufacturers the statistics of the production of pig iron in Canada in the first six months of 1902. The figures show a slight increase as compared with the last half of 1901, but a very great increase as compared with the first half of that year.

In the first six months of 1902 the production of all kinds of pig iron in the whole of the Dominion amounted to 157,894 gross tons, as compared with 149,952 tons in the last half of 1901 and 95,024 tons in the first half of that year. The increase in the first half of 1902 over the last half of 1901 was 7,852 tons, or over 5 per cent, while the increase over the first half of 1901 was 62,780 tons, or over 66 per cent. Of the total production in the first half of 1901, 12,000 tons were Bessemer and low phosphorus and 57,209 tons were basic pig iron. The coke furnaces made 147,892 tons and the charcoal furnaces 9,912 tons. Neither spiegeleisen nor ferromanganese has been made in Canada for several years.

The unsold iron held by Canadian pig iron manufacturers on June 30, 1902, none of which was intended for their own consumption, amounted to 37,721 gross tons, as compared with 59,472 tons on December 31, 1901, and 28,711 tons on June 30, 1901. Of the unsold iron on hand on June 30, 1902, less than 2,000 tons were made with charcoal, the remainder being coke iron.

On June 30, 1902, Canada had 14 completed blast furnaces, of which 8 were in blast and 6 were idle. Of this total 9 were equipped to use coke for fuel, 4 to use charcoal and 1 to use mixed charcoal and coke. In addition three coke and two charcoal furnaces were being built on June 30, 1902, but work upon two of the coke furnaces was temporarily suspended.

IRON ORE IN FINLAND.—Important discoveries of iron ore are reported to have been made near Pasvig Fjord in Finland, yielding from 40 to 56 per cent of metal. The deposits, although less in extent, are stated to be richer than those of the Dunderland Valley in Norway.

WASTE ACID DISPOSITION.—The London *Colliery Guardian* says that the manufacturers of galvanized iron in South Staffordshire are confronted with a very serious problem in the matter of the disposal of their spent acids. At present this refuse is turned into the rivers and streams, but the county councils of Staffordshire and Worcestershire, after long protestations, have now made up their minds to take drastic action in the matter, under the powers given to them by the Rivers Pollution Act. The effect of this new departure will, it is to be hoped, induce the galvanized iron makers to recognize that these so-called waste products are really not waste at all. They contain elements of commercial value which only require scientific treatment to turn to good account.

UNITED STATES MINERAL EXPORTS.

During the eight months ending August 31 the exports of domestic minerals and manufactures amounted to \$177,423,116, which compares with \$176,415,107 in the corresponding period last year. The increase of \$1,008,009 this year is due in a large measure to the large exports of copper and to exports of labor-saving machinery.

The shipments of refined copper aggregated 256,200,887 pounds, which comprises about 59.4 per cent of the total domestic production during the eight months. Last year in the corresponding period the exports were 134,167,593 pounds, or 33.9 per cent of the output. The increase of 122,033,294 pounds this year was chiefly in the exports to Great Britain and Germany.

The iron and steel exports were valued at \$66,034,949, as against \$69,441,006, the decrease of \$3,460,-

bought last year, and only in a few instances has this decrease been made up by bituminous coal.

Salt exports show a falling off of about 51 per cent from last year, owing partly to the smaller consumption of the fish preserving industry.

Lead, zinc and quicksilver all show increased exports.

In the other substances exports have been influenced by a fluctuating European market.

NEW ZEALAND MINES IN 1901.

In his annual statement laid before the New Zealand Parliament recently, the Minister of Mines, Hon. Mr. McGowan, referred to the continued expansion of the mining industry, as a whole, in New Zealand. He said: "During the year 1901 the production of gold and silver, and also of coal and lignite, was considerably in excess of that of the previ-

year. Kauri-gum to the amount of 7,541 tons, valued at £446,114, was obtained. Compared with the production of the previous year, this shows a decrease of 2,618 tons. The quantities and values of the chief mineral productions for the past two years are summarized for comparison as follows:

Product.	1900.		1901.	
	Quantity.	Value. £.	Quantity.	Value. £.
Gold, oz.	378,616	1,439,602	455,561	1,753,783
Silver, oz.	326,457	38,879	571,134	65,258
Copper ore, tons. . . .	12	45	3	105
Antimony, tons. . . .	3	101	30	136
Manganese ore, tons. . . .	166	588	208	614
Mixed minerals, tons. . . .	2,126	12,754	696	7,775
Chrome ore, tons. . . .	28	110	.....	.....
Coal exported, tons. . . .	112,707	98,136	159,643	142,176
Coal consumed in New Zealand.	981,283	490,642	1,067,995	533,998
Kauri gum, tons. . . .	10,159	622,293	7,541	446,114
Shale, tons. . . .	.....	.....	12,048	6,024
Total value ....	.....	2,703,147	.....	2,955,983

The increase in values last year was £252,836, or 9.4 per cent. The total value of gold, silver, coal and other minerals, including kauri-gum, produced up to the end of 1901 was £79,060,964.

As to new mineral products, the report says the new shale-oil works at Orepuki have now got into full working order, and oils of various grades adapted for both burning and lubricating purposes, as well as other products obtainable from the distillates of shale, have been produced. Doubtless it will take a little time to find a market for the entire production of the works, but it is to be hoped that the enterprise of the company will be rewarded in the near future. During the year 1901 the quantity of sulphur exported amounted to 143 tons, this being a decrease of 1,549 tons as compared with the output of the preceding year. Messrs. Donaldson Bros., at Macrae's (Otago), are the only people in the colony who prepare scheelite for the market. The mineral exists in other claims, but nothing is being done at the batteries to separate it from the quartz sand. Further prospecting at Alexandra South (Otago) has proved the continuity of the antimony lode, and trial shipments of the ore have been exported with the object of its being tested on a fair scale. The manufacture of hematite paint is still carried on at Thames and Parapara. Pending the formation of a company to work the cinnabar lode near Waitahuna (Otago) operations are suspended. Nothing further appears to have been done to work copper or chrome ore. An interesting and valuable discovery of rock phosphate has been made at Clarendon, near Milton (Otago). Analysis shows this to be of a quality suited for application to land, and also for the manufacture of super-phosphates. It is possible that the mineral may also be found associated with the limestone rocks in other parts of Otago.

With reference to gold dredging, the Minister stated: Many of the dredges referred to in my last statement as being built have been completed and put to work, the number of working dredges at the commencement of the present year showing an increase of 38 as compared with that of the previous year. The total number of dredges in the West Coast and Southern districts is as follows: Working, 183; building, 59; standing (some having been sold for removal), 33; undergoing removal, 19; total, 224. It is estimated that this branch of mining finds direct employment for over 2,000 persons, apart altogether from the men employed in building dredges and machinery, and in effecting their repairs. In addition to this, many industries are benefited more or less directly as the result of dredging operations, and the success which has attended the bulk of New Zealand ventures has had its effects in other directions, tending to the increased wealth of the people. It must not, however, be forgotten that much of the wild speculation which characterized the recent boom has affected a large number of people in a diametrically opposite direction; but this is a natural outcome of all cases of similar speculative excitement. The fact of the dredging industry gradually settling down again into a steady groove is satisfactory, and this method of winning gold from river beds and alluvial flats is one which is destined to occupy an important position for years to come. Following the lead of New Zealand, dredge mining has taken a firm hold in

UNITED STATES EXPORTS OF DOMESTIC MINERAL PRODUCTS AND THEIR MANUFACTURES.

ARTICLES.	January-August, 1908.		January-August, 1902.		Changes, 1902.	
	Quantities.	Value.	Quantities.	Value.	Quantity.	Value.
Aluminum, and manufactures of. . . . .	.....	\$116,126	.....	\$77,518	.....	D. \$38,608
Brass, and manufactures of. . . . .	.....	1,391,976	.....	1,116,861	.....	D. 275,115
Bricks, building and fire. . . . .	.....	401,102	.....	334,876	.....	D. 66,226
Cement, bbls.	233,848	445,686	244,016	379,758	I. 10,168	D. 65,928
Chemicals: Acids. . . . .	.....	133,026	.....	169,307	.....	I. 36,281
Ashes, pot and pearl, lbs.	815,233	41,229	1,199,278	56,111	I. 384,045	I. 14,882
Copper sulphate, lbs.	46,772,316	2,211,163	29,730,278	1,185,785	I. 17,042,038	I. 1,025,378
Lime, acetate, lbs.	37,307,864	679,741	43,365,339	695,908	I. 6,057,475	I. 16,167
Coal, anthracite, tons.	1,454,223	6,488,133	6,266,609	2,864,718	D. 827,614	D. 3,623,415
Bituminous, tons.	3,689,273	8,890,116	3,618,453	9,565,042	D. 70,820	I. 674,926
Coke, tons.	363,051	1,069,603	264,493	1,196,406	I. 1,442	I. 126,803
Copper ore, tons.	9,793	1,345,846	13,407	1,013,898	I. 3,614	D. 331,948
Ingots, bars, plates and old, lbs.	134,167,593	21,966,531	256,200,887	31,632,403	I. 122,033,294	I. 9,665,872
Manufactures of. . . . .	.....	1,214,572	.....	1,424,520	.....	I. 209,948
Gunpowder, lbs.	871,975	120,657	1,037,466	142,466	I. 165,491	I. 21,809
Other explosives. . . . .	.....	1,163,816	.....	1,363,898	.....	I. 200,082
Instruments and apparatus for scientific purposes. . . . .	.....	4,699,376	.....	3,686,843	.....	D. 1,012,533
Iron and steel, manufactures of: . . . . .	.....	.....	.....	.....	.....	.....
Iron ore, tons.	37,966	94,627	47,122	152,990	I. 9,156	I. 58,363
Pig iron, tons.	46,828	708,288	22,203	397,421	D. 24,665	D. 310,867
Bar iron, lbs.	34,442,828	569,938	37,768,094	642,182	I. 3,325,266	I. 72,244
Bars or rods of steel, lbs.	53,520,572	941,988	48,735,975	945,382	D. 4,784,597	I. 3,394
Billets, ingots and blooms, tons.	27,053	671,135	1,794	54,524	D. 25,259	D. 616,611
Hoop, band, and scroll, lbs.	2,262,023	48,848	2,945,982	65,658	I. 683,959	I. 11,810
Iron rails, tons.	606	17,257	177	3,370	D. 429	D. 13,887
Steel rails, tons.	249,281	6,715,113	60,036	1,664,422	D. 189,245	D. 5,050,691
Iron sheets, lbs.	11,910,806	337,261	5,965,572	178,132	D. 5,945,234	D. 159,129
Steel sheets, lbs.	46,889,367	818,000	23,818,103	512,239	D. 23,071,264	D. 305,761
Tin and terne plates and taggers tin, lbs.	912,512	46,824	2,903,081	120,210	I. 1,990,569	I. 73,386
Structural iron and steel, tons.	36,223	1,959,047	41,848	2,095,053	I. 5,625	I. 136,006
Wire, lbs.	120,246,063	2,994,087	149,649,334	3,546,019	I. 29,394,271	I. 551,932
Scrap and old, fit only for manufacture, tons.	9,518	151,447	6,759	105,266	D. 2,759	D. 46,181
Hardware. . . . .	.....	5,887,658	.....	7,405,152	.....	I. 1,617,494
Nails, cut, lbs.	16,930,238	364,117	11,419,213	238,586	D. 5,511,025	I. 125,531
Nails, wire, lbs.	29,985,584	633,967	39,034,840	789,725	I. 9,649,256	I. 155,758
Spikes and tacks, lbs.	2,783,607	175,425	2,815,180	160,195	I. 31,573	D. 6,230
Machinery, Electrical. . . . .	.....	3,919,574	.....	3,896,547	.....	D. 23,027
Metal working. . . . .	.....	1,912,397	.....	1,946,659	.....	I. 28,259
Pumps and pumping. . . . .	.....	1,295,146	.....	1,579,104	.....	I. 283,958
Steam engines, and parts of. . . . .	.....	4,461,685	.....	21,858,435	.....	I. 3,226,022
All other machinery. . . . .	.....	18,632,413	.....	4,446,644	.....	D. 15,041
Pipes and fittings. . . . .	.....	3,571,537	.....	3,281,975	.....	D. 289,562
All other manufacturers of iron and steel. . . . .	.....	12,513,227	.....	9,968,932	.....	D. 2,544,295
Lead, pig, bar, and old, lbs.	4,721,904	212,838	6,363,304	277,552	I. 1,641,350	I. 64,714
Manufactures of. . . . .	.....	245,860	.....	266,956	.....	I. 21,096
Lime, bbls.	18,426	18,952	27,318	31,325	I. 8,892	I. 12,373
Marble and stone, unmanufactured. . . . .	.....	71,143	.....	154,482	.....	I. 83,339
Roofing slate. . . . .	.....	613,198	.....	476,313	.....	D. 136,885
All other manufactures. . . . .	.....	453,707	.....	445,799	.....	D. 7,908
Mineral oil, crude, gals.	83,646,366	3,965,483	91,610,712	3,983,293	I. 7,964,346	I. 17,810
Naphtha, gals.	13,455,105	1,106,325	14,273,270	968,022	I. 818,165	D. 138,303
Illuminating, gals.	527,062,370	33,985,618	518,015,414	32,152,990	D. 9,046,956	D. 1,832,188
Lubricating and paraffin, gals.	48,541,128	6,749,794	53,462,692	7,177,127	I. 4,921,564	I. 427,333
Residuum, bbls.	421,399	979,083	605,315	608,202	I. 143,916	D. 370,881
Nickel, nickel-oxide and matte, lbs.	3,855,244	995,367	1,993,411	567,443	D. 1,861,833	D. 427,924
Paints, pigments, and colors—Zinc oxide, lbs.	5,893,074	251,916	7,022,934	288,587	I. 1,129,860	I. 36,621
All other. . . . .	.....	1,138,490	.....	1,191,382	.....	I. 52,892
Phosphates, tons.	547,613	4,061,507	495,998	3,766,053	D. 11,615	D. 295,454
Quicksilver, lbs.	515,760	294,857	585,176	327,476	I. 69,416	I. 32,619
Salt, lbs.	14,743,700	63,793	7,539,576	41,338	D. 7,204,124	D. 22,457
Tin, manufactures of. . . . .	.....	324,998	.....	352,504	.....	I. 27,506
Zinc ore, tons. . . . .	.....	26,098	.....	862,029	I. 3,172	I. 26,098
Pigs, bars, etc., lbs.	5,036,633	213,764	5,913,806	269,714	I. 877,173	I. 55,950
Manufactures of. . . . .	.....	53,168	.....	73,262	.....	I. 20,094
Total value. . . . .	.....	\$126,415,107	.....	\$177,423,116	.....	I. \$51,008,009

057 being due principally to the falling off in steel rails and steel billets, for which the domestic demand is now enormous. Machinery exports show an increase of \$3,500,171, or 11.5 per cent over last year, the total amount being \$33,721,386, against \$30,221,215. A good part of this increase is credited to mining and metallurgical machinery sent to Mexico and other countries.

Mineral oil exports show a heavy falling off in illuminating oils, while the market value was lower. Germany and several other European countries are importing less American oil, but Great Britain, Japan and South America have become heavier buyers.

Coal exports have suffered from the miners' strike and the large home demand. Several countries are receiving less than one-half the quantity of anthracite

ous year, whilst the output of kauri-gum and miscellaneous minerals shows a falling off. The gross values of the mineral production, including kauri-gum, for 1901, however, show an increase of over £250,000 as compared with those of the year 1900, and doubtless the increase would have been greater still but for the fact that the phenomenally high state of some of the rivers interfered with gold dredging operations during a considerable portion of the year. The total production of gold and silver during the year 1901 was 1,026,695 ounces, valued at £1,819,041, and shows an increase in value of £340,560 as compared with the production of the preceding year. The output of other minerals, including coal and lignite, has been 1,248,164 tons, representing a value of £1,136,942, or 141,680 tons in excess of the previous

several other countries, and not only have men from this colony been engaged to supervise operations elsewhere, but dredges have been built here and exported. In a former statement reference was made to the spoiling of land by dredges working on alluvial flats. This is a question which has not been lost sight of by the department. The most noteworthy improvements in dredge construction which appear to have recently come to the front are a system of elevating the tailings by centrifugal force, thus dispensing with the long and heavy ladder elevator, and an adaptation of water power (where such is available) for working the machinery, instead of by steam. Both of the arrangements named are working successfully. It is also satisfactory to note that in several instances more care is being bestowed on the saving in fine gold.

The amount of royalty paid to the government for the use of the cyanide patent rights in the colony now amounts to £5,132, or more than half of the cost incurred in the acquisition of the said patent rights.

IRON AND STEEL EXPORTS AND IMPORTS.

The total value of the exports of iron and steel, including manufactures, from the United States for the eight months ending August 31 is reported by the Bureau of Statistics of the Treasury Department at \$65,904,829, which compares with \$69,346,379 for the corresponding period last year, and \$87,174,200 in 1900. The chief items of iron and steel included in these exports were as follows, in long tons:

	1901.	1902.	Changes.
Pig iron	28,281	257,210	I. 228,929
Scrap iron and steel..	12,920	62,400	I. 49,480
Steel billets	27,953	1,794	D. 25,259
Rails	249,281	60,036	D. 189,245
Sheets and plates.....	26,250	13,296	D. 12,954
Structural steel.....	36,223	41,848	I. 5,625
Wire	53,681	66,704	I. 13,023
Nails	22,187	24,049	I. 1,862

Structural steel, chiefly for bridge-work, wire and nails, were the only items showing gains this year; in most of the others there were marked decreases.

Imports, on the other hand, show a large increase. The total value of these imports for the eight months this year was \$23,456,760, against \$12,210,382 in the corresponding period in 1901. Some of the items of imports were, in long tons:

	1901.	1902.	Changes.
Pig iron.....	28,281	257,210	I. 228,929
Scrap iron and steel..	12,920	62,400	I. 49,480
Steel billets and ingots.	5,235	162,409	I. 157,014

This shows the extent of the demand for raw material, which has compelled the imports of considerable quantities from Great Britain and Germany. amounted to \$177,423,116, which compares with \$176,278 tons, against 609,058 tons last year, an increase of 187,220 tons. The larger part of this ore was from Cuba.

BLACKBAND IRON ORE IN SCOTLAND.—

The London *Engineer* says: "The Scotch mineral known as Lanarkshire blackband, which was discovered in 1801, has been practically exhausted, as there are now no pits in the Lanarkshire coal-field where it is worked as a principal product, though a small quantity of a thin blackband is raised with the gas coal at one or two pits. Some blackband of excellent quality is, however, still raised in Fife and Midlothian for smelting in the Lanarkshire furnaces, while the somewhat leaner blackbands of Ayrshire are still fairly plentiful."

GERMAN IRON AND STEEL EXPORTS.—

Exports of iron and steel from Germany have shown this year very considerable increases, which have had a favorable effect upon the trade. The official returns for the seven months ending July 31 give the exports of leading items of iron and steel as below, in metric tons:

	1901.	1902.	Changes.
Pig iron	67,938	162,667	I. 94,729
Blooms and billets.....	62,941	341,610	I. 278,669
Ingots	164,534	202,870	I. 38,336
Plates and sheets.....	136,277	157,864	I. 21,587
Angles and shapes.....	196,963	220,903	I. 23,940
Rails	94,600	183,852	I. 89,252

A very considerable part of the gains shown above was due to purchases of materials for the United States.

GOLD MINING IN THE NOME DISTRICT.

By LEWIS GARRISON.

Mining operations in the Cape Nome District were exceedingly backward in the season of 1902 on account of lack of water. Not since the summer of 1898, when the district was first inhabited largely by white men, has there been such a dry season. Still, notwithstanding the difficulty of working claims, the two banks and members of the larger mining companies estimate the year's production to be around the \$5,000,000 mark, which is possibly only \$2,000,000 short of the previous output. While it is true that the larger operators have been unable to produce much gold on account of lack of water, there are new companies operating this season and many individual mine owners have contributed to the output, working as they could with what water was available. Added to the amount is the winter diggings, which were carried on more extensively last winter than ever before. Dumps were taken out and these washed up by the snow water, which always flows when spring comes. A dump which had taken all winter to mine would be washed up by means of sluice boxes in two or three days' time, possibly longer.

Water is of the greatest importance in the Nome District. C. D. Lane saw the possibilities in the early days of the new camp, and set on foot a pumping scheme for putting water on top of the highest claims, thus having a supply far above the natural course of the streams. Mr. Lane's pumping plant has been completed this summer and is now pumping large volumes of water from Snake River, near the town of Nome, over the top of Anvil Mountain to Niccola Gulch, where it is being used on his company's claim, the Mattie; and the water after being used on this claim is conveyed by flume and ditch to another of the company's claims, No. 2 Above, on Anvil Creek. Mr. Lane is also working a claim on Copper Gulch, which is directly on the pipe line. Mr. Lane has not made any attempt to supply water to other claim owners, and is simply using the water furnished by his pumping plant for claims operated by his company. The expense of operating the pumping plant is enormous, the lowest price for which a good steam coal can be landed at Nome being a little less than \$15 per short ton.

Mr. W. L. Leland came to Nome in the early days of the rush in 1900, and was comparatively unknown. He had but little capital, it is said, but used what he had judiciously in sending out prospecting parties to ascertain the value of the new camp in a mining sense and to locate claims. He early saw the possibilities of conveying the water from the head waters of the different creeks to the place of operations by means of ditches. He endeavored to interest the Pioneer Mining Company in the scheme of working the Glacier and Snow Gulch claims by hydraulicking, but as this company was then involved in the famous Alexander McKenzie receivership litigation, its time was too much occupied to take up the matter. The following year, however, Mr. Leland, James M. Davidson and W. S. Bliss began to build the first ditch for conveying water in this part of Alaska. It was from the head of Nome River, and carried water to the Pioneer Mining Company's claim on Snow Gulch and Glacier Creek. To-day this firm, under the name of the Miocene Ditch Company, has constructed and now has in operation two more ditches from the same source of supply, conveying water to Dexter Creek and all tributaries of Dexter Creek at its head. Men are at work digging a tunnel through the divide between Snow Gulch and Anvil Creek, and as soon as this is completed water will be at hand for working the whole of Anvil Creek besides the rich benches of Specimen Gulch and also on Anvil Creek down to Discovery Claim.

The ditch proposition in the Nome District, it is said, will be the salvation of the country. Mr. Leland has risen to a prominent position. The Miocene Ditch Company, includes W. H. Metson, of San Francisco, and H. J. Knowles, of the same place. The enterprise has been carried on without outside financial aid. Water is now furnished the miners on

Dexter Creek and its tributaries in quantities sufficient to sluice and in some places hydraulicking on a small scale.

The Pioneer Mining Company, composed of Jafet Lindeberg, Erik O. Lindblom, John Brynteson and Magnus Kjelsberg, was the first mining company in this district, the organizers of the corporation having been the original discoverers of gold in this part of Alaska. To carry on mining more extensively than in the past and in a more up to date and scientific manner, the company was incorporated last winter in Seattle. The New York offices of this company are at 25 Broad Exchange Building, New York, and are in charge of Mr. J. E. Chilberg, the secretary. This company owns more than 500 acres, and the past season it has purchased some other properties of known value. This company, together with the Nome Exploration Company, of which J. W. Kelly is at the head, have purchased a group of claims at the head of Dexter Creek over the divide from Niccola Gulch, among which is the famous Sugar claim. They are prospecting these claims and others around the district with drills. This way of prospecting has proven to be the best so far introduced in this country, as holes can be driven through frozen ground, rocks, etc., and tests made of the ground with great accuracy.

The Northern Mining and Trading Company, Mr. C. A. Ferrin, manager, is another large company operating here. Mr. E. W. Backus, of Minneapolis, is the president of this corporation. The company owns possibly the largest lot of claims adjoining each other of any here. It owns some rich claims on the benches of both Specimen and Anvil creeks; it has interests outside of the Nome District as well, and has a dredger on Solomon River.

The Hot Air Mining Company has a bench claim on the right limit of Glacier Creek, and last winter constructed a ditch for its own use from the head of Rock Creek. It is now hydraulicking the ground and ground sluicing. It is the simplest working scheme of any claim in the country, and goes to show what the conveying of water by ditches and flumes here means. This claim is on the bench of Glacier directly opposite the confluence of Snow Gulch with Glacier Creek. It is said the old channel ran right across this claim. This channel has been traced up Snow Gulch, where the Pioneer Mining Company's three claims are, and over the divide it is lost, but is taken up again on Niccola Gulch and turns over the divide to Dexter Creek and across Extra Dry Creek down to Nome River. Specimen Gulch is right in the line of the channel, and it is thought Anvil Creek afterwards cut through it, depositing gold in another channel down through Anvil Creek and across the tundra in a line yet to be found into Bering Sea. Extra Dry Creek benches on the left limit, are known to carry pay gravel, and the creek claims on this creek have been worked profitably. Water, however, is the great problem and the lack of it has prevented much work. It is proposed to erect a plant to pump from Nome River this winter or next year. The plan is that this should be built by the Nome Exploration Company and the Pioneer Mining Company jointly to operate on these benches.

It is evident that the Nome District has entered a period of transition which marks the history of all similar districts. It is passing from the stage of small individual operations to those in the hands of companies with large capital.

COAL MINING IN CHINA.—

The Shantung Mining Company has received information from Tsingtau, China, announcing the discovery of a coal measure 4 meters in thickness, at a depth of 175 meters in the shaft sunk on the Weihsien coal-fields. The coal is of good quality and shows a regular formation, and judging from appearances the measure is identical with that of the same thickness which was bored by the company at a depth of 188 meters in the same vicinity. It is now expected that the working of the coal deposits in Weihsien will be commenced by the company before the end of the present year.

BLACK EAGLE MINE, LAKE OF THE WOODS, ONTARIO, CANADA.

SPECIAL CORRESPONDENCE.

THIS mine, formerly known as the Regina, has for the past two years, been in the hands of a new company and under new management. A thorough and

the vein. Drifting is being carried forward north and south, on the third level. Ninety feet north from the shaft a winze has been sunk 12 feet and reveals a good width of vein. In one instance, the drift is 95 feet high and broken through the levels as shown on the plan. The vein on the eighth level is widening and continues to do so up to the ninth or bottom

piled up near the mill. A water-fall within four miles, is available for the generation of power for this and other mines which are of great promise, in this district.

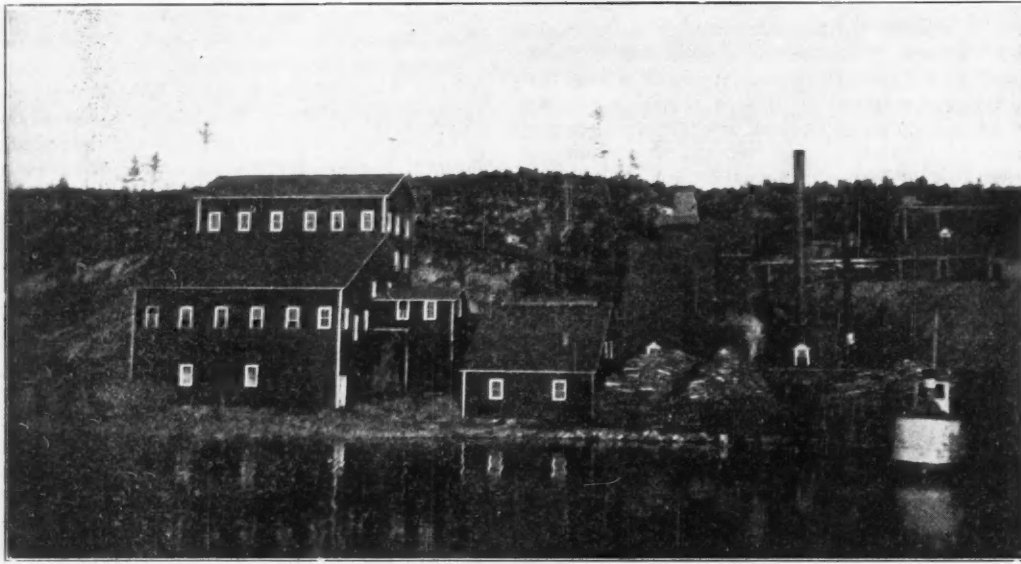
THE SEWARD PENINSULA IN ALASKA.

In *Professional Paper No. 2* of the United States Geological Survey, now in press, Mr. Arthur J. Collier gives the results of a geologic reconnaissance of the northwestern portion of Seward Peninsula, Alaska.

Seward Peninsula is an irregular land mass, comprising approximately 20,000 square miles, and extending from the western coast of Alaska westward to within 60 miles of the Asiatic coast, from which it is separated by Bering Strait. It separates Bering Sea from the Arctic Ocean, and is itself cut off from the mass of the continent on the south by Norton Bay, a deep indentation of Bering Sea, and on the north by Kotzebue Sound, an inlet from the Arctic Ocean. A mountain axis, represented in the Kigluak and the Bendeleben ranges, divides the peninsula naturally into a southern and a northern part. The northwestern part of the peninsula comprises an area of approximately 5,000 square miles, lying west of the 164th meridian and north of Port Clarence and Imuruk Bay.

The general geology and the physiography of the region are discussed, and it is noted that at Elephant Point, on the south shore of Kotzebue Sound, the remains of the horse, the elephant, and the bison are associated with those of the reindeer and the musk ox. This association of animals known to require such diverse climates would seem to indicate very unusual climatic and physical conditions.

With regard to the economic geology of the region, the mineral values of this northern part of Seward Peninsula, like those of the southern part, lie in its



STAMP MILL, BLACK EAGLE MINE, LAKE OF THE WOODS, ONT.

almost complete change has taken place in the plant and buildings. Although such alterations have been costly, the apparently permanent character of the mine, appears to warrant the new company in making the expenditures. Through the courtesy of the managing director, Mr. N. L. McMillan, the writer has recently had an opportunity to make a visit of inspection to the property. Mr. McMillan is interested in good paying mines in West Africa and other places and his experience as business manager has been of great advantage to the company.

Costly experiments, such as the purchase of mining machinery which was not suited to the conditions, and the erection of an expensive plant which was equally useless, were the chief reasons to be assigned for the failure of the mine to show itself heretofore a profitable investment. The kind of work done has been valuable only in the way of furnishing experience to others.

The seven Tremain mills of two stamps each have been taken down and are for sale. The present equipment includes a Jenckes thirty-stamp mill, which is now running continuously and has been since last December. There are also three boilers of 50-horse power each, Jenckes hoist, corliss engine, lathes and a saw-mill. A new house for the manager, boarding houses, assay office, general office, and a number of cottages for married men, are located conveniently near. A new complete cyanide plant is replacing the old one and in a short time will be in use, with a capacity of from 200 to 300 tons.

The careful supervision of all work is apparent, and this reflects credit on the general manager, Mr. Tom Tretheway, a man of large experience and well known as a successful manager.

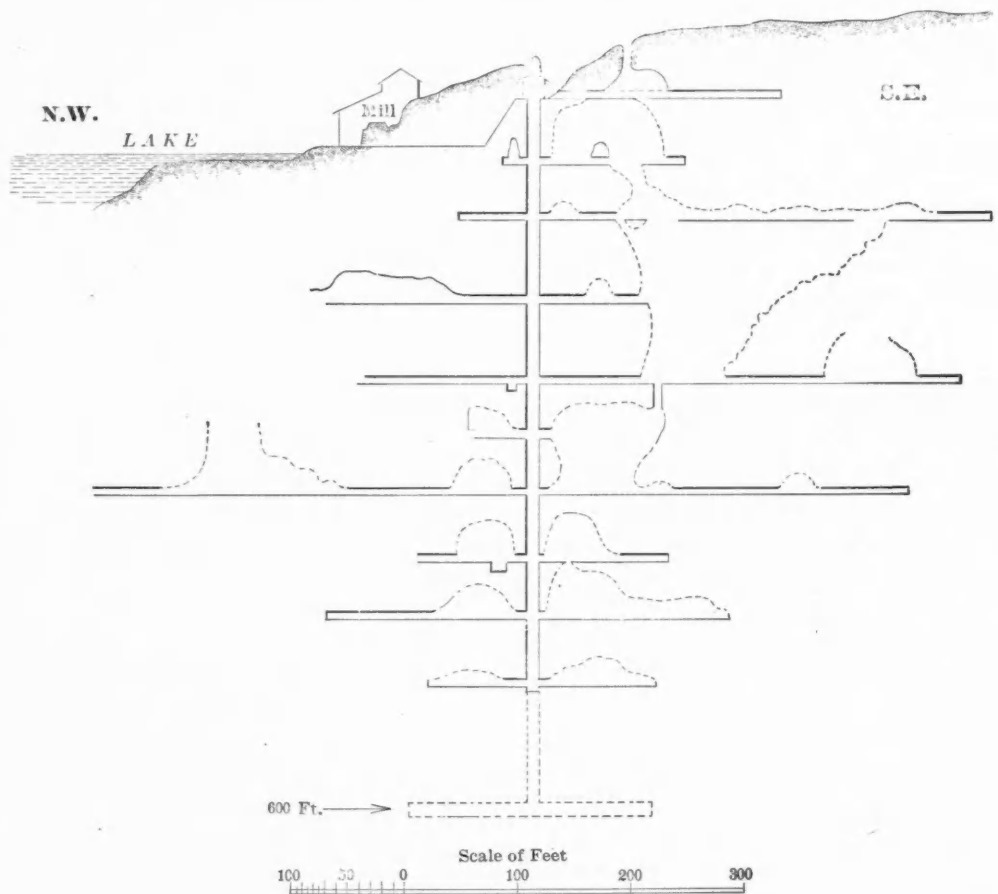
There are 6 veins on the property, although as yet, nearly all the work has been done on one vein which runs almost north and south, dipping below the lake towards the north. It is a true fissure in granite, resembling protogine. Towards the south the vein runs into altered diabase (trap) and curves toward the east. At this end, the schistose matter is mixed with the quartz. The vein dips towards the west in the granite, but changes to the east in the trap.

At the time of the writer's visit, the main shaft was 504 feet deep, and about 3,535 feet of drifting had been done. At a depth of 452 feet a cross-cut has been driven east 18 feet cutting the vein, which at the seventh level dips into the hanging wall. At the eighth level, a cross-cut north 18 feet, passes through

level, where it is 10 feet wide. The walls in the upper workings are granite, but between the fifth and eighth levels, they change to trap. The vein matter is a waxy-white quartz with a rich blue streak, containing free gold. The writer is informed that

there are about 8,000 tons of good pay blocked out. About 1,500 tons of concentrates now on hand will be put through the new cyanide plant as soon as it is completed. The values of these concentrates are from \$35 to \$50 per ton. About 2,000 cords of wood are

placer gold deposits. No quartz deposits of economic importance have been discovered. The region under consideration lies north of the better-developed and better-known gold fields of Nome. It produced in 1901 about \$100,000 in gold.



BLACK EAGLE MINE, ONTARIO, AUGUST, 1902.

The source of the gold is undoubtedly in the bed rock, not far distant from the placers where it is found; but it may be definitely stated that this bed rock is not the Port Clarence limestone, which is not gold-bearing.

The York region, that part of the Seward Peninsula lying west of the York Mountains and including all streams flowing southward into Bering Sea and northward into the Arctic Ocean, is notable both for its good prospects of placer gold-mining and for its stream tin (cassiterite), which is reported as having been found by prospectors in nearly all the streams northeast of York for a distance of about 20 miles. The York River, which is reported to be very rich in placer tin, heads in Brooks Mountain and carries granite pebbles and boulders, which suggest that the tin had its origin near the granite contact. The wide distribution of this mineral in the creeks of the York District justifies the belief that the veins from which it is derived will yet be discovered.

DUST IN MINING.—The London *Colliery Guardian* says: "In the course of an interesting paper at the Sanitary Congress, on the Dust Problem, Sir James Crichton-Browne referred to the alarming mortality amongst gannister workers, brought to light by Dr. Birmingham and Dr. Robertshaw. The miners, he said, who suffered most seriously from the effects of dust, were, of all the classes of workers, those whom it was most difficult to protect against it, but their safety would be greatly enhanced by improved ventilation of the mines on well-recognized principles, perhaps by the spraying of them from time to time so that the dust might be laid, and by the use of flameless explosives that get rid as far as possible of carbonic oxide, and by insisting on long intervals for meals, during which open-air breathing might be enjoyed. Very similar in its action to gannister dust was probably that of basic slag, to which he alluded in order to illustrate not the direct effects of irritating dust, but the collateral dangers that attended it."

THE STRENGTH OF FERRO-CONCRETE.—In a recent communication to the Paris Académie des Sciences, M. Considère describes a series of valuable experiments carried out by a commission appointed by the Ministère des Travaux Publics, with a view to ascertaining the precise part played by the metal in ferro-concrete constructions. The specimens tested by the commission were generally 2 meters long, and had a cross-section 10 centimeters square. Each of these concrete bars was reinforced at the corners by four steel rods, having a total section of 113 square millimeters. The concrete employed was made by mixing 300 kilograms of Portland cement with 0.800 cubic meters of gravel, passing a 25-millimeter screen, and 0.400 cubic meters of sand, passing a 5-millimeter screen. It was found that in setting, the contraction of the concrete gave rise to an initial compression in the steel reinforcement amounting to 2.86 tons per square inch of the metal. The corresponding tensile forces simultaneously called forth on the concrete amounted to 74 pounds per square inch. Tested in tension, it was found that the specimens stretched rapidly until the stress on the concrete was practically equal to the ordinary tensile strength of this material. From this point the tested bar stretched much less rapidly, and throughout this period the tensile stresses in the concrete remained constant, the whole increase of load being taken by the steel bars. It follows, therefore, that during this period the elastic modulus of the concrete was zero. Summing up, M. Considère states that ferro-concrete submitted to tension acts precisely as ordinary concrete, so long as the tensile stress does not exceed the usual breaking stress of ordinary concrete. When the ferro-concrete is stretched beyond the usual elastic range of ordinary concrete, the tensile stress on the concrete remains constant up to the ultimate breaking-point, the whole of the additional load being taken up by the metal. When subjected to repeated tensile stresses, however, the fraction of the load carried by the metal tends

to augment, and that of the concrete to fall, until ultimately the working stress on the concrete is only 70 per cent of its original value. If finally, after a serious of loadings and unloadings, the maximum load is raised 30 per cent, the concrete again exerts a tensile resistance equal to its primitive value. It may be added that the modulus of elasticity in compression of a ferro-concrete bar is reduced on stretching the latter.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

SPECIALLY REPORTED.

WHEN AGREEMENT TO SELL MINING PROPERTY DOES NOT GIVE EQUITABLE INTEREST.—Under the laws of Montana (Civil Code, sections 1012, 1013) providing that the trustees or officers of a mining company shall not have power to sell any part of the mining ground unless the sale is first authorized by a vote of two-thirds of all the stockholders at a meeting called for that purpose at which three-fourths of the stock is represented, a proposition by the president of such a company that on the deposit of a specified sum as the purchase price the corporation will at once proceed to obtain the requisite consent of its stockholders for selling, and will then sell and convey a specified portion of its mining claim, and the acceptance of such proposition and the deposit of the money, do not give the proposed purchaser an equitable title to the mine, or a right to extract ore from the same.—*Anaconda Copper Mining Company v. Heinze* (69 *Pacific Reporter*, 909); Supreme Court of Montana.

RIGHT TO APPOINT RECEIVER SHOULD BE EXERCISED WITH GREAT CARE.—The appointment of a receiver after notice, before final trial, is a jurisdiction which should be exercised with great care and with studious effort to avoid mistake and oppression; and to appoint a receiver without notice is a jurisdiction and power that should be rarely used, and never except in a clear case of imperative necessity, when the right of the complainant, on the showing made by him, is undoubted, and when such relief and protection can be given in no other way. When such notice can be given it should be given, unless there is imminent danger of loss, or great damage, or irrevocable injury, or the greatest emergency, or when by the giving of notice the very purpose of the appointment would be rendered nugatory; and such instances are of rare occurrence in the Federal Courts, because of their power, when an injunction is asked for, to grant a temporary restraining order which may be served at the same time that the notice is served, to prevent action by the defendant or his agent, and to preserve the existing conditions until the application for an injunction and receiver can be heard.—*Cabaniss v. Reco Mining Company* (116 *Federal Reporter*, 318); United States Circuit Court of Appeals.

LIABILITY OF MINE-OWNER DURING OPERATIONS UNDER LEASE.—An employee of a mining company, working at the bottom of a shaft which is operated by the company to hoist ore from the various levels of the mine for lessees of the levels and an employee of a lessee allowing ore to fall and injure the former are not fellow servants. Where a level in a mine is in the same negligent condition when leased by the owner as at the time of a subsequent injury of an employee of the owner, in a shaft operated by him, resulting from such condition, the owner is responsible for same. The construction in an upper level of a mine of an ore tramway on such a grade that cars started on the same or started by gravity, will run into a shaft by their own momentum, without providing sufficient barriers to prevent their falling down the shaft, is negligence. Where the mine owner leased a level having such an ore tramway, which was operated by the owner for the benefit of the lessee, and an employee of the lessee, without being guilty of negligence, allowed a car to run into the shaft and injure an employee of the owner, it was

held that the negligent construction of the tramway without barriers, was the proximate cause of the injury.—*Union Gold Mining Company v. Crawford* (69 *Pacific Reporter*, 600); Supreme Court of Colorado.

RECORDING MINING CLAIMS.—Under the laws of the United States (Revised Statutes, sec. 2324) providing that the miners of each mining district may make regulations regarding the recording of claims, etc., and the law of Oregon (Hill's Annotated Laws, sec. 3831) providing that when a mining district has been organized the claims therein shall be recorded, claims in a district which is not an organized district were not required to be recorded. In a suit to determine an adverse interest in certain mining claims where the evidence of the witnesses of the complainant who claimed to have marked out the claims and upon whom the right of discovery depended was contradictory and false, at least in part, it is proper to dismiss the case.—*Payton v. Burns* (69 *Pacific Reporter*, 134); Supreme Court of Oregon.

SUFFICIENCY OF TITLE THROUGH GOVERNMENT CERTIFICATES.—Where the seller of a mining claim, who has entered, paid for the claim and obtained a certificate of purchase from the government, tenders a deed in pursuance of his contract, the buyer cannot refuse the deed and rescind the contract merely because the seller has not received his patent for the claim at the time the tender of the deed was made. Delay in the mere administration of the affairs of the land office does not lessen the title of the purchaser in the lands he has purchased. The estate vests on the issuance of the certificate of purchase and a deed conveys the fee as well before as after.—*Bash v. Cascade Mining Company* (69 *Pacific Reporter*, 402); Supreme Court of Washington.

ACCIDENT TO MINER BY FALLING CAGE.—A cage used for lowering and hoisting the men at a mine is not "falling material" within the meaning of that term as used in r. 20 section 25 of the Metalliferous Mines Inspection Act, and the Amendment of 1899 (Cap. 49, sec. 12) does not create any duty on the mine owner to provide protection from a falling cage. The accident in this instance was due to the negligence of the engineer, held to be a fellow servant of the injured miner.—*McElvey v. Le Roi Mining Company* (9 *British Columbia Reports*, 62); Supreme Court of British Columbia.

LIMITATION ON APPLICATION OF LAW REGULATING LIGHTS IN MINES.—The provisions of Section 28b of the Miners' Act of Illinois (Hurd's Revised Statute, Illinois, 1901, c. 93), that a good and sufficient light be maintained at the bottom of the shaft, so that persons coming to the bottom may discern the cage and objects in the vicinity, applies to the safety of men while entering and leaving the mine, and has no reference to the safety of persons traveling along the entries in the mine.—*Joseph Lumaghi v. John Voytilla* (101 *Illinois Appellate Court Reports*, 112); Appellate Court of Illinois.

LIABILITY FOR COMMISSIONS ON SALE OF MINE.—An agent employed to sell a mine, having found a customer with whom the owner made a contract of sale, is entitled to his commissions, in the absence of an agreement to the contrary, though the contract was not specifically enforceable, and was cancelled by the parties. And one is not precluded from insisting on his commission for selling a mine, being made superintendent by the purchaser, he procures a modification of the contract of sale, extending time of payment.—*Mattes v. Engel* (89 *Northwestern Reporter*, 651); Supreme Court of South Dakota.

NON-OBSERVANCE OF MINE RULES.—An employer is entitled to make and insist on the observance of reasonable rules for the conduct of his business, and if in consequence of the non-observance of such rules by an employee the latter is injured, the employer will not be liable. It was held in this case that the em

ployer was not liable for the death of an employee resulting from such employee using, in direct violation of the rules of the mine, the cage instead of the ladders to ascend from the mine, although the ladders did not in some particulars conform to the requirements of the Mines act.—Anderson v. Mikado Mining Company (3 Ontario Law Reports, 581); Ontario Court of Appeal.

ABSTRACTS OF OFFICIAL REPORTS.

United States Reduction and Refining Company.

This company reports its income account for the year ended August 31, 1902, as follows: Income from all plants in operation, \$1,368,673; premiums obtained from bonds purchased, \$3,290; interest received on bonds purchased, \$840; sundry interest received, \$1,046; total income, \$1,373,849.

The deductions were: General expenses, \$152,669; cost maintenance idle plants for year, \$13,016; organization expenses, \$21,067; improvements, \$226,364; totals, \$413,116. Of the balance of \$960,733 the sum of \$489,924 was spent in dividends and interest and \$470,809 remained as surplus.

The summary of the balance-sheet as of August 1, 1902, shows: Assets—Cost of property acquired, \$12,116,195; sinking fund investment, \$28,000; outside investments at cost, \$534,165; cash in banks and in hands of treasurer, \$266,257; accounts receivable, \$61,350; Continental Trust Company, New York, \$1,130; Kessler & Co., \$4,019; stock and supplies on hand, \$373,412; total assets, \$13,384,528.

The liabilities were: Preferred stock outstanding, \$3,945,800; common stock outstanding, \$5,918,800; first mortgage bonds, \$3,000,000; accounts payable, \$30,100; unpaid interest coupons, \$3,540; unpaid dividends, preferred, \$260; unpaid dividends, common, \$219; accrued interest, \$15,000; profit and loss surplus, \$470,809; total liabilities, \$13,384,528.

The acquisition of the plants of the Standard Milling and Smelting Company, the Colorado-Philadelphia Reduction Company, at Colorado City, the Union Gold Extraction Company, the Metallic Extraction Company, and the National Gold Extraction Company of Florence, Colo., by the company August 1, 1901, resulted, according to the report, in keeping in full operations such plants as were necessary to accommodate all business offered, thereby greatly reducing the cost per ton for reduction and refining of ore.

The plant of the United States Smelting Company was acquired early in 1902. The supply of ore is received from Colorado and the Southern and Western States. Ore contracts of long duration have been entered into, which, together with other favorable conditions, says the management, justify expectations of a continuance of the first year's prosperous conditions.

Since the formation of the company, dividends have been paid on the preferred stock of \$176,886, and on the common stock of \$118,038, making a total of \$294,924, the rate being 6 per cent on the preferred and 4 per cent on the common.

Consolidated Lake Superior Company.

The report of this company—better known as the Clergue Syndicate—which has just been issued, covers the year ending June 30, 1902, and shows that the net earnings of the subsidiary companies amounted to \$1,428,136. After payment of general expenses and the 7 per cent dividend on the preferred stock of the Consolidated Lake Superior Company, requiring the sum of \$1,135,507, there was left a balance of \$292,629. The cash subsidy from the Canadian Government on account of the Algoma Central & Hudson Bay Railway Company, amounting to \$380,424, brought the surplus for the year up to \$673,053. A surplus of the Consolidated Lake Superior Company and subsidiary companies brought forward from the preceding year amounted to \$423,755, making the total surplus of June 30, 1902, \$1,096,808. The general balance sheet of the company, including its subsidiary companies, on June 30, 1902, shows a valuation of \$93,060,309 for the subsidiary

companies and the current assets amount to \$6,927,345 more. The capital stock consists of \$70,385,400 common and \$23,547,250 preferred, with a balance of cash yet to be received from purchasers of preferred stock amounting to \$9,239,100, which sum will be available for completing construction and for working capital. The names and scope of the operating corporations are given below:

The Algoma Central & Hudson Bay Railway Company—Owns and operates railway lines upon the Ontario land grants and a fleet of steamers on the lakes; operates the British-American Express Co., Ltd., and the Algoma Central telegraph lines.

The Algoma Steel Company, Limited.—Owns and operates the steel works and rail mill and the blast furnaces now under construction at Sault Ste. Marie, Ont.

The Lake Superior Power Company.—Owns and supplies power from the water-power canal on the Canadian side of the St. Mary's River; owns and operates the Helen iron ore mine, nickel mines and smelters in the Sudbury District, and ferro-nickel, charcoal and by-product plant at Sault Ste. Marie, Ont.

The Algoma Commercial Company, Limited.—Owns the Ontario land grants, and conducts land, timber and mining operations and operates sawmills upon these grants.

The Michigan Lake Superior Power Company.—Water-power canal of about 60,000 hydraulic horsepower on the American side of the St. Mary's River.

Tagona Water & Light Company.—Supplies water and electric light and power to the town of Sault Ste. Marie, Ont.

The Sault Ste. Marie Pulp & Paper Company.—Owns and operates ground wood pulp and sulphite pulp mills and the Algoma Iron Works, at Sault Ste. Marie, Ont.

The International Transit Company.—Owns exclusive franchise for street railway lines in Sault Ste. Marie, Ont., which are now under construction and nearly completed.

Trans-St. Mary's Traction Company.—Now constructing street railway lines in Sault Ste. Marie, Mich.

The portions of the annual report referring to the iron and steel operations of the company are as follows:

"Within the past year the operations of your company have been very largely increased by the starting of the bessemer steel works and rail mill of the Algoma Steel Company, Limited. The entire mechanical equipment of this plant was installed and practically ready to run at the end of 1901, but owing to delay on the part of the contractors for the structural work and the lack of girders and columns to support the cranes, without which the mill could not be operated, it was impossible to put this plant into operation before the close of the fiscal year, since which time it has been running continuously.

"The steel produced thus far in the Algoma works has been made from purchased pig iron, of which a large supply was acquired in advance of the starting of the plant at advantageous prices, as the blast furnaces of the company have not yet been completed. Two furnaces, one to use charcoal and the other coke, are under construction, and are now well advanced towards completion, to be followed by additional furnaces as may be required. Like everything else dependent upon iron and steel manufacturers for material, the construction of these furnaces has been greatly delayed. The completion of the blast furnaces will give to the company its own supply of pig iron, which can be produced profitably at a much lower price than it can be purchased, and which, furthermore, will enable the company to earn the bounty which the Canadian Government pays on pig iron made from ore mined within the Dominion, only the bounty on steel now being earned.

"The bessemer steel works and rail mill now in operation constitute a thoroughly modern and well-equipped plant. Its converting capacity is sufficient to produce 600 tons of bessemer steel ingots daily, while the blooming mill and rail mill will furnish

from 1,000 to 1,200 tons per day. The arrangement of the plant is such that material can be handled at a minimum labor cost, and an unusually large output per man is thus obtainable. The availability of electric power at much lower cost than steam is one of the great advantages enjoyed by this plant. With the exception of the two main engines, which drive the blooming mill and the rail train, and the blowing engines of the bessemer steel department, electric power is used throughout the works for the operation of cranes, live rolls, tables, saws, drills and straightening presses. There are few plants so well arranged and so efficiently equipped, and with the completion of the blast furnaces, which will furnish an independent supply of pig iron, it is believed that this works will be in a position to compete successfully with the best equipped mills in the manufacture of steel rails.

"Renewals on the 18,000 miles of railroad now existing in Canada, and the requirements of the new construction which is bound to increase largely under the progressive policy of the Dominion and Provincial Governments, will furnish a sure market in Canada for steel rails far in excess of the capacity of this first mill, as indicated by the orders which your company already has booked.

"The iron ore operations of the company are probably the most important productive undertakings, not alone on account of the profits on the mining and sale of ore, but also because of the profitable business which the transportation of this material furnishes to your railroad and steamship lines, and beyond this the completion of the blast furnaces will make these mines the independent basis of the steel industry at Sault Ste. Marie.

"Iron ore shipments thus far have been confined to the Helen Mine, which has fully justified all expectations as to the extent of the deposit and the quality of the ore. The shipments during the fiscal year of your company ended June 30, 1902, amounted to 341,750 tons, as compared with 91,436 tons during the preceding year.

"Since the beginning of the present season, work at the Helen Mine has been devoted largely to the systematic development of the property in such manner as to permit continuous shipments much larger than have been possible since the first opening of the mine. Shafts have been sunk, and at different levels workings are being extended in a solid body of ore, which will permit the mining of ore of higher grade even than was indicated at the surface. The first ore is now being raised from underground, and an increase in the output is now made possible.

"Lake Boyer, on the shore of which the Helen Mine is located, has been drained, and a large body of surface ore has thus been uncovered. An extensive deposit adjoining the Helen Mine, which was not included in the property originally purchased, has been acquired by your company, and this will permit the extension of operations at the Helen Mine to greater advantage. The purchase of this adjacent property with other mining claims held by the same owners, now gives your company complete control of the Michipicoten Iron Range, and provides not only opportunity for present mining operations, but also abundant reserves for the future. Your company will be in a position to meet the demand for iron ore for a term of years extending so far into the future that the time of its termination need not be considered.

"The extension of the railroad to the Josephine Mine, 10 miles beyond the Helen, now affords an outlet to the second of your iron ore properties that is under development. At the Josephine a shaft has been sunk and the development of the deposit is being carried on, so that shipments once begun can be continued without interruption. The beginning of another season will see this mine ready to make shipments of high grade bessemer ore. Several other iron ore properties have been located along the surveyed line of the Algoma Central & Hudson Bay Railway, and as railroad construction proceeds their development will be undertaken.

"The abundant supplies of hardwood upon the On-

Ontario land grants of your company will furnish ample fuel resources for many years. To meet the requirements of the charcoal blast furnace, and for other purposes, by-product retorts and beehive kilns have been constructed, with sufficient capacity to give a surplus of charcoal for sale after providing amply for all requirements of your company's various plants, recent developments having opened markets elsewhere which will permit the sale of large quantities of charcoal at profitable prices, so that this department of operations can readily be made the source of considerable additional income.

"Adjacent to the blast furnaces and steel works at Sault Ste. Marie, a battery of 20 by-product retorts has been constructed, with all the necessary equipment for recovering the products of distillation and preparing them for sale. Experience has fully established the practical economy of making both coke and charcoal in ovens, which will prevent the loss of the by-products, and in the operation of the charcoal retorts which have been constructed at Sault Ste. Marie the recovery of the waste products—acetate of lime and wood alcohol—will practically pay the cost of making the charcoal. There is a ready market for the by-products and advantageous offers for the purchase of the entire output have already been made. In addition to this by-product plant, 56 beehive kilns have been built at points on the Algoma Central & Hudson Bay Railway, where supplies of hardwood can be obtained to the best advantage.

"Development of the nickel properties of your company in the Sudbury region of Ontario has proceeded continuously during the past year, and excellent progress has been made in bringing these properties into productive condition. Mining has been carried on steadily at both the Gertrude and Elsie mines, and in addition to the raising of a large amount of ore these mines have been developed so that the desired output can be maintained continuously. Further exploration of these properties confirms the first impressions as to their extent and value, and it is now beyond doubt that in these mines your company possesses some of the most important deposits of nickel ore in the world.

"The pure nickel ore, that is the ore which contains nickel without copper, is shipped from your mines to Sault Ste. Marie, Ont., where it is crushed and roasted to remove the sulphur. The sulphurous fumes from the roasting furnaces are utilized in the sulphite pulp mill, thus saving the usual expense of sulphur or pyrites required in chemical wood pulp mills. The roasted ore is pressed into briquettes, in which form it is ready for smelting with iron ore in the blast furnace, the resultant pig iron containing a sufficient percentage of nickel to make a high grade of nickel steel when this iron is converted into steel. Pending the completion of the blast furnaces, a large stock of the briquettes of roasted nickel ore is being accumulated, ready for smelting when the furnaces go into operation.

"The making of the ferro-nickel pig and its subsequent conversion into nickel steel will complete the series of processes for which the group of works at Sault Ste. Marie was designed, and will permit the production of nickel steel with economy and positive results. The early completion of the blast furnaces, which is being hastened with all possible urgency, is all that is now required to put this plan into full operation.

"The ores from the nickel mines containing copper are roasted in heaps at the mines to remove the sulphur, and the cinder is ready then for processes of reduction to metallic nickel and copper. The first smelter at the Gertrude Mine was put into operation in June, with a daily capacity of about 20 tons of matte, containing about 16 per cent of nickel and 8 per cent of copper, and two additional smelters of similar capacity are under construction and approaching completion. A bessemerizing plant for the elimination of the iron and impurities and the concentration of the 24 per cent matte to about 80 per cent of metallic content will complete the works and enable the production of high grade matte of the preferred marketable form.

"Contracts have been made with consumers of this

matte, who will take a quantity equal to the entire output of the plant now provided for, and who will erect large works on the company's property on the American side at Sault Ste. Marie for the refining and further manufacture of this material, using power from the new canal. Negotiations have just been concluded for the establishment of large electrolytic refining works at Sault Ste. Marie, Ont., which will require an additional supply of ore from the nickel mines and matte from the smelters to be reduced into metallic nickel and copper.

"The entire series of metallurgical and chemical processes based upon the nickel deposits of your company constitute a practical manufacturing undertaking of assured commercial success."

BOOKS RECEIVED.

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

El Peru para la Inmigracion. Kezon del Ucayali. Lima, Peru; published by the Ministerio de Fomento. Pages, 20, with map.

Manual of Business. American Artisan Series. Compiled by Sidney P. Johnston. Chicago; Daniel Stern. Pages, 264. Price, \$1.50.

Notes on Naval Progress, 1901. Compiled by the Office of Naval Intelligence, United States Navy Department. Washington; Government Printing Office. Pages, 442; illustrated.

Nineteenth Annual Report on the Coal Mines of the State of West Virginia, 1901. James W. Paul, Chief Mine Inspector. Charlestown, W. Va.; State Printer. Pages, 302; illustrated.

Report of the Bureau of Mines of the Department of Internal Affairs of Pennsylvania, 1901. James E. Roderick, Chief of Bureau. Harrisburg, Pa.; State Printer. Pages, 896; illustrated.

Industrial Trusteeship; Its Application to Capital and Labor. By Alfred B. Tugman. Philadelphia; the Tugman Company. Pamphlet, 28 pages.

United States Geological Survey: Mineral Resources, 1901. Production of Phosphate Rock. By Dr. Joseph Struthers. Pages, 16. *Production of Precious Stones.* By George F. Kunz. Pages, 56. Washington; Government Printing Office.

Iowa Geological Survey. Volume XII. Annual Report for 1901. Dr. Samuel Calvin, State Geologist; A. G. Leonard, Assistant State Geologist. Des Moines, Iowa; published by the Survey. Pages, 512; illustrated.

University of Wisconsin. Bulletin No. 63. Origin of the System of Land Grants for State Education. By Joseph Schafer. Madison, Wis.; published by the University. Pages, 56.

BOOKS REVIEWED.

Map of the Town of Whitehorse and the Adjacent Copper Belt. Compiled by H. G. Dickson. Whitehorse, Yukon Territory, Canada. Blue-print 15 by 25 inches; scale, 3,000 feet to 1 inch.

This is a map showing the claims located on the newly discovered copper belt in the vicinity of Whitehorse in the Yukon Territory. Reference has heretofore been made in our columns to this district, which is but little developed, but is said to show favorable indications. The map has evidently been compiled and prepared carefully, and will be necessary to anyone who is interested in the district.

Nineteenth Annual Report of the Coal Mines in the State of West Virginia, for the year ending June 30, 1901. J. W. Paul, Chief Mine Inspector. Charleston, W. Va.; State Printer. Pages, 302; illustrated.

This report, in addition to statistics, gives much detailed information about the coal mines of West Virginia, including some interesting descriptions of the different mines and their conditions. It has also some detailed reports on accidents occurring during

the year, while an appendix gives a summary of recent changes in the mining laws of the State. Another appendix gives the rules and mine regulations adopted by two or three of the larger coal mining companies. Several maps and plans of the mines are also given.

The Quarry Industry in Southeastern New York. By Edwin C. Eckel. Reprinted from *Twentieth Report of the State Geologist.* Albany, N. Y., University of the State of New York. Pages, 40; illustrated. Price, 15 cents.

This monograph, which was prepared for the New York Geological Survey, gives an account of the quarry industries of an important district. The quarries of Westchester, Putnam, Dutchess, Rockland and Orange counties, in New York, and of the upper portion of New York City itself, have been extensively worked and have furnished a large quantity of building stone. The monograph gives a general account of the geology of the area and of the various kinds of rock which are available for building. These include granite, sandstone and limestone, the latter varying in quality from the Newark conglomerate to the Tuckahoe marble, which at one time was in extensive use and supplied the material for some important buildings. There are a large number of quarries in the district, and mention is made of nearly all of these, with the character and quality of their product. The monograph is illustrated by several photographs, including sections of stone, and by a map of the district showing the location of the quarries and the geology of the area.

The Treatment of Steel. Compiled for and published by the Crucible Steel Company of America. Pittsburgh, Pa.; Third Edition. Pages, 160; illustrated.

This is a revised edition of a treatise compiled some time ago on the various methods of treating steel, and has been considerably enlarged, and revised from the previous editions in order to bring it up to date. It gives particulars of the latest practices. The different chapters or parts treat of annealing of steel, the method of heating steel, furnaces, effect of heat upon steel, the tempering and hardening of steel. The last named subject occupies the larger part of the book, and includes a chapter containing a number of hints previously expressed on the minor points connected with handling of steel. It is a very convenient little treatise for all who have to use tool-steel and others of the highest forms of the metal. The somewhat difficult subject of tempering seems to have been very carefully treated indeed.

Changes from the second edition include a new introduction together with new engravings. A single and a double plate showing the effects of heat upon steel have been added; also some foot-notes explanatory of the text. A new chapter is given on Self-Hardening Steel besides some additions to the brief paragraphs above referred to. A copious index is given, the latter being of value in opening up a chapter full of details on Hardening and Tempering Steel which hitherto has been somewhat unavailable.

The Journal of the Canadian Mining Institute, 1902. Edited by B. T. A. Bell, Secretary. Ottawa, Canada; published by the Institute. Pages, 650. Illustrated.

This volume contains the papers presented to the Canadian Mining Institute during the year 1902, together with the proceedings of the annual meeting in Montreal and the discussions of the different papers. The Institute was fortunate this year in receiving a large number of excellent papers. It would be difficult to make a selection from them for special mention. The subjects treated were in some cases of peculiar interest to Canada, but many were of interest to all the mining fraternity. In all, 41 papers are included in the list and those of more local interest ranged from the mines of Eastern Ontario to those of British Columbia and the Yukon. Many subjects which were treated with especial reference to particular properties or mines, are really

of much wider interest, as for instance, the papers on the Strength of Wire Rope, on Gold Dredging, on the Use of Compressed Air, on Concentration Methods of Mining Low-grade Ores, Pumping of Compressed Air, Hoisting and Haulage, Safety Lamps and Colliery Explosions, and on Mine Timbering. Upon the whole, the volume includes a great deal which is of permanent value and it forms a very acceptable addition to mining literature.

The Saline Deposits of California. By Dr. Gilbert E. Bailey. Being *Bulletin No. 24*, California State Mining Bureau. San Francisco; issued by the State Mining Bureau. Pages, 216; with maps and illustrations. Price, 50 cents.

This carefully prepared *Bulletin* is one of the most important yet issued by the State Mining Bureau of California. Coming shortly after that on the copper deposits of the State, which we noticed a short time since, it indicates the quantity and value of the work which the Bureau has in hand. The present book is of especial value, as there is practically no literature on the subject beyond some scattered papers and articles in journals, which are for the most part difficult to locate or obtain. The saline deposits constitute an important element in the mineral wealth of the State. Chiefly located in the southeastern section, the alkaline lakes, dry deposits and beach lines of the Great Basin contain great stores of natural soda, borax, niter and other salts which are as yet only partially worked and developed.

In this *Bulletin* the author has supplemented previous information by personal observations and reconnaissances occupying more than a year and a half. To this also has been added much information obtained from prospectors, owners, operators and others who have worked or studied the great saline deposits. The object has been rather to give a general view of the subject than to present a special description of each locality. The latter would indeed be impossible in view of the space limitations; nevertheless, many interesting details are furnished.

Part I is a general description of the Great Basin, showing its topography, surface geology and probable history, as well as the general nature of the deposits. The different classes of sodium salts are then taken up separately; Part II, treating of the Borates, perhaps the most important of all in an economic sense. Part III describes the Carbonates; Part IV the Chlorides, and Part V the Nitrates. An appendix contains a bibliography of the subject. The *Bulletin* is illustrated by a number of half-tone reproductions of photographs, and by five maps, showing the location of the salines, their elevation, and other particulars, the present dry lakes, the ancient lakes, and a general map of the State. The locations of springs and wells are also given.

These saline deposits present an important field for future development, and this work will serve one purpose by directing attention to them and to their possibilities. Apart from this, it is an addition to our information on a very interesting but hitherto little known region.

CORRESPONDENCE.

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

Cornwall Tin Ores.

SIR: Let me call your attention to a mistake in your article on "The Mining in Cornwall in your issue of September 15, reporting the yield of Cornish ores in pounds of "black tin" per ton. This should be "black tin"—the washed and concentrated cassiterite, instead of the smelted metal, a difference of nearly one half.

Your readers may not realize what a very low grade of ore is still being worked in Cornwall according to these figures. At Carn Brea, for instance, a yield of 27 pounds of black tin per ton means that

the ore is being concentrated 83 into 1, the concentrate fetching perhaps \$325 per ton, a yield of under \$4 per ton of crude ore. Very few deep vein mines in the West, with erratic ore bodies and heavy pumping charges, can show any such low costs, in spite of modern shafts and machinery.

ARTHUR L. COLLINS.

Telluride, Colo., Sept. 22, 1902.

(The reference to "block tin," instead of "black tin," to which our correspondent calls attention, was a compositor's error, which unfortunately escaped the attention of the proofreader.—EDITOR E. & M. J.)

Amethyst Tints in Glass—Radium.

SIR: In a recent issue of the *JOURNAL* I observed a communication from R. C. Canby, of Santa Barbara, Mexico, in reference to the "purple tinge" of glass in the vicinity of El Paso, when it has laid up some time on the ground exposed to the sun's rays. He suggests that the change from clear glass to amethyst may be due to radium in the soil.

Permit me to say that this peculiarity is not confined to El Paso. I saw the same thing in Albuquerque 28 years ago, and purple tinged or amethyst colored glass that was clear a few months ago can be seen everywhere about this town. In the old mining camps above here this change is particularly noticeable. The same may be true of many other places in New Mexico for aught I know.

I write this to tell you that there is something here in the binoxide of manganese not yet named, and that there are several veins of pitchy black substance in the vicinity of the manganese that may or may not be pitchblende, but may contain radium; and that if anyone wishes to test these veins for any new metal, all it will cost will be the transportation, either by mail or express. I will furnish the samples and pack them according to order, with the hope that radium may be found here.

A. L. SANGRE.

Rincon, N. M., Sept. 17, 1902.

Major J. Wesley Powell.

SIR: Those who know the intimate relations I sustained to Major Powell for so long a time would perhaps experience no surprise if I should confess that I have not been able to bear his death with entire composure. During the twelve years I spent with him in a secretarial capacity I learned to love him—no weaker word would suffice. Others will tell of his attainments and achievements in geology, ethnology, sociology, anthropology, and philosophy; let it be my sad pleasure to testify to the charm of his personality and the delightfulness of his companionship.

Whether he was engaged in the office on administrative plans, an official report, an anthropological essay, a philosophical disquisition, or was roughing it in the West in the endeavor to trace the stratigraphy and unfold the structure of some mountain range, it was pleasant to be with Major Powell. He was gentle, generous, patient and optimistic under all conditions; never irritable, dictatorial or censorious. He had not a trace of false pride; suggestions from his secretary were welcomed as heartily and weighed as fairly as if they had come from the highest source. He did most of his professional and literary work at the office, subject to incessant interruption, and this he bore with marvelous patience and equanimity. The door was seldom locked, and when it was, the locking was done by someone else, unobserved by him. A man of generous and warm impulses, his sympathy for those in distress or trouble was easily and often touched. On such occasions his words were few, but the moistened eyes revealed the emotion. But he could be firm, and even stern, if necessary. Like all strong men who are prime movers among mankind, he did not escape criticism. Sometimes this was due to misunderstanding arising through the carelessness of others. I recall an instance of this which caused him more amusement than irritation. In one of his sociological essays he had deplored the hyperbolic and misleading character of much of the

advertising of the day, and had written (and printed) the opinion that advertisements should be "simple and plain." Some journalist had evidently used these words in a dictation on the subject, and they reappeared as "small and plain," whereupon the press indulged in some caustic comment. Another instance was more serious, and exemplified his large-heartedness and forbearance. Owing to the loss of his right arm (at Shiloh), he was obliged to depend, for hasty computations, etc., largely on assistants. Some simple computations had been made for him by others for use in connection with a question of no little importance. Into these an error had crept, and this vitiated his published conclusions. The error was promptly detected and the Major was duly scored. I was considerably to blame, and I berated myself roundly for the oversight; but not a word of censure ever came from him on whom the weight of the error fell.

Major Powell was passionately fond of music. In camp he sang simple melodies much of the time, and it seems only yesterday that he dictated to me something like this: "For one to declare that he loves an oratorio but does not care for a melody, is as if one should say that he loves a rose garden but does not care for a rose." This broadly cultured man loved intensely the beautiful as bodied forth in painting and all forms of art; but he loved more this old Earth with all its unkenneled mysteries—its cañons, its mountains, and, later in life, its ocean shores. I have descended with him into his beloved Cañon of the Colorado, climbed with him the Tewan "Baldy" of New Mexico, and ridden with him on the breaker-packed sands of the Pacific, and at all these places he was very happy, and all of them he was loath to leave. I was with him on his last trip to the far West, and well I remember what seemed to me a strong disinclination on his part to quit the region in which he had delighted since early manhood. The necessity seemed to me to sadden him, as though the thought was with him that he should nevermore return. I thought he would; but I now suspect that he knew.

PHILIP C. WARMAN

Washington, D. C., Sept. 27, 1902

QUESTIONS AND ANSWERS.

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

Solar Power.—Can you direct me to a solar power company, with office in New York? Or to any power company of that class?—F. W. I.

Answer.—There is no company of the kind you refer to in New York. A company was organized some time ago which made very wild claims, even talking about smelting ores by solar heat. It did nothing, however, but sell a little stock. The only solar power apparatus that we know of, it as Pasadena, in Southern California.

It is interesting to note that the late John Ericsson took much interest in his later years in the question of utilizing the sun's heat. He made many experiments, but had not reached the point of securing any practical results when he died.

Molybdenite, Tungsten and Vanadium Ores.—Will you kindly inform me as to the value of the following ores: Molybdenite, Wolfram and Vanadium.—P.

Answer.—It is impossible to give regular quotations for these ores, as they are usually sold on assay, and the ores vary much in metallic contents and therefore in value. Molybdenite, to be marketable at all, must contain at least 45 per cent Mo; ore carrying 50 to 55 per cent would probably bring \$300 to \$400 per ton. Any large increase in production of this, or of the other ores mentioned, would be followed by a fall in prices. Wolfram or tungsten ore, to sell well, should run from 60 to 70 per

cent tungstic acid. The value of such ore ranges from \$125 to \$325 per ton. The total production in the United States last year was 179 short tons. For vanadium ore there is little demand and no price can be quoted. The demand is chiefly for vanadium oxide, the supply of which comes chiefly from certain iron slags.

Talc.—We understand that the talc supply in the United States is not equal to the demand; that only about 190,000 tons are produced in the United States yearly; that in addition to this yearly output American consumers use \$50,000,000 worth of imported talc per annum. Can you furnish us the correct facts in regard to the demand, consumption and output of talc in the United States; also the names of the branches of business being the largest users of the article. We are the owners of an almost inexhaustible supply of talc and contemplate putting it on the market on the Pacific Coast and in the Middle West. Our article has been analyzed by New York talc men and pronounced superior to the North Carolina and New York product.—O.

Answer.—The figures which have been given to you are wildly exaggerated. The production in the United States last year amounted to 69,200 short tons of fibrous talc, and about 8,000 tons of common talc. The imports which were chiefly of prepared or powdered talc, were only 2,386 tons, valued at \$27,032. The chief use of talc is in paper making, but it is also employed in the finer kinds of wall plaster, and in making paint. The demand is on the increase. The imported talc is used largely in making the powders sold by druggists.

The Cyanide Process.—Will you kindly answer through your columns: What is the average cost per ton of ore for cyaniding? What is the most approved, or best appointed cyanide plant in the United States? Is the process much used in Mexico or other countries? Is there in publication a book exactly describing the various operations in sequence, and the cost of material used in the cyanide process, as it is considered in the most approved method? What countries would you consider it desirable to obtain patents for a very rapid method of extracting gold and silver from a cyanide solution, a process that would not require any change at all in the plant? Would a rapid method for the recovery of the gold and silver more than compensate for the loss of the entire cyanide solution from which the metals are recovered, or would the cyanide solution necessarily have to be used over again in order to make it a payable proposition?—G. A. B.

Answer.—Your first question is too general. It would be impossible to give any general average cost for treating ore by cyanide. The cost varies, as in every process for treating ores, with local conditions, cost of handling ore, cost of materials and many other items. The latest cyanide plants in the United States are now under construction in the Black Hills in South Dakota. It would be hard to say which plant in this country was the best or built on the most approved lines. A very full review of recent progress in the application of the cyanide process is given in *The Mineral Industry*, Volume X, which has just been published.

The cyanide process is largely used in Australia, New Zealand and South Africa. It is used to some extent in Mexico, but not so frequently as in the United States, chiefly because ores adapted to treatment by this process are not as common there as in this country. The statement just given will show you where patents for any improvements in the process should be taken out.

With regard to your last question, no answer can be given. Saving of time would be an advantage; but the value of a new process must be judged by its results as a whole. Your process or improvement must be completed and tested before any opinion could be given as to its importance.

Good books on this subject are Bosqui's *Practical Notes on the Cyanide Process*, and James' *Cyanide Practice*.

ACETYLENE GAS FOR MINE LIGHTING.

A new form of lamp using acetylene gas for the purpose of lighting mines has recently been introduced by John S. Cummings & Company, of Tunnelton, W. Va. They have given it the name of the "Standard" acetylene mine lamp. It is a compact, portable lamp, giving a bright, cheap light of about 20 candle-power. It is especially useful for making examinations and in surveying; there is no grease to soil the maps, and the flame is so small and clear that it affords an accurate point on which to sight instruments. The lamp burns from two to three hours, has a height of 3 inches and a diameter of 1½ inches.

The lamps are made of brass so as to be practically indestructible, and are composed of three parts—first, the bowl or body of the lamp, which contains the water supply; second, the gas chamber; and, third, the carbide holder. With each lamp there is an extra gas chamber and carbide holder, which construction permits the changing of charges while the light is kept burning. When the carbide is about exhausted in the holder in use, an extra one, which should always be ready, is prepared and lighted from the one still burning; a fresh supply of water is put in the bowl, and the extra holder replaces the one in which the carbide is exhausted. This is a feature no other lamp has. These lamps, when the simple directions are followed, burn the same as an ordinary gas jet, without any more smoke or smell, and do not burn out the oxygen nor produce harmful gases to the same extent. At the present price of carbide this light can be produced more cheaply than with oil.

BISMUTH IN ARIZONA.—Capt. W. I. Rand, of Boston, has lately returned from a trip to Arizona, where he examined some mining properties located a number of years ago by some Mormons. One property examined contained ore which resembled horn silver, but which turned out to be a carbonate of bismuth, unusually pure. The property is situated on the Salt River near its junction with the Verde, and between Fort McDowell and Superstition Mountain.

ZINC, LEAD AND FLUORSPAR DEPOSITS OF WESTERN KENTUCKY.—The United States Geological Survey has undertaken a preliminary investigation of the zinc, lead and fluor spar deposits in Crittenden, Livingston and Caldwell counties, Kentucky. The work is under the direction of Mr. E. O. Ulrich, who in 1889 made a partial survey of the region, and in the following year published a brief report and map of Crittenden County, locating nearly all of the fissure veins that in the last two years have been proved to contain valuable deposits of mineral. In view of the accuracy of the old map and report, much is expected of the survey now in progress. Mr. Ulrich is accompanied by Mr. W. S. Tangier Smith, of the United States Geological Survey, who will pay attention particularly to underground work, and Mr. Albert Crider and Mr. Julius Fohs, temporary assistants.

A CONVENIENT GRINDER FOR SMALL SHOPS.

The illustration herewith shows one of a number of different styles of emery grinders known as Hero No. 10, designed especially for blacksmith shops, etc., where power is not available, and manufactured by the Robertson Manufacturing Company, Buffalo, N. Y.

The column is a casting bolted to the heavy iron base; the head has a slotted stem telescoping into the column and secured with bolts and nuts. The company has had a long experience in this class of tools and has aimed to produce a tool that would give long service with ease of operation. To avoid friction in the main running parts, this machine has ball bearings in the column with a hardened steel shaft carrying the heavy balance wheel, which is geared three to one of the treadle, insuring a strong

momentum to the heavy driving wheel. The drive employed is a steel chain belt running on sprockets to the operating spindle, producing a positive drive with loose tension, the head being adjustable in the column to take up any slack of the chain. It has adjustable tool rests for use when the wheels be-



HERO EMERY GRINDER.

come worn. Each machine is furnished complete with two emery wheels 6 by ¾ inches.

The machine stands 38 inches high; length of wheel spindle, 9 inches, made of steel, with right and left-hand nuts. The weight for shipment is about 100 pounds. This machine would be found convenient in many mine repair shops.

PROCESS FOR MAKING METALLIC COKE.

BY OSCAR DAUBE.

The problem of how to successfully smelt fine ores, either raw or roasted, upon a commercial scale is one that has attracted a considerable amount of attention from smelters and furnace men. Up to the present time the only partially successful method of handling this class of ore, has been by briquetting, in which it frequently happens that the binding material is objectionable.

The method developed by the writer consists in utilizing the fusing quality of bituminous coal, during the process of coking. Numerous experiments extending over a considerable period of time and on a fairly large scale have shown that the combination of coal dust or culm with fine iron ore, and, if desired, the necessary flux, will produce in the coking oven a metallic sponge or coke ready for the blast furnace. A specimen from a recent experiment of this kind showed by analysis:—

	Per cent.
Carbon	42
Iron	37
Limestone	13
Ash	8
Total	100

Analysis of magnetic iron ore before coking:

	Per cent.
Magnetite	71.08
Silica .....	.22
Phosphorus .....	.03
Titanium .....	.42

A bar produced by the reduction of this metallic sponge showed a tensile strength of 80,500 pounds per square inch, which, considering that this is one of the hardest ores to prepare for reduction, is thought to be very encouraging. Other experiments have been made with flue dust, fine roasted ores and soft Mesabi ores, with results equally as good, if not better.

The raw material must be finely crushed and thor-

oughly mixed before being charged into the coke oven. The gases generated from the coking process, carried on in a retort oven, are recovered and used for fuel in the operation, besides leaving a surplus of about 3,000 cubic feet per ton of charge.

The time required for coking is 24 hours and for the reducing of the sponge to metal, 4 hours, making a total of 28 hours for the conversion of coal dust and ore into finished metal. It is of course, apparent that in the production of the sponge, a reduction of the metallic oxides takes place in the coking process, and the metallic sponge is in an ideal condition for reduction in the furnace. The addition of the flux to the sponge is only made if the reduction to metal is to be made in one operation; otherwise it is added in the blast furnace.

The production of a metallic sponge containing say, iron and carbon only, can take place in ovens of any size or make. For the reduction into metal, however, a vertical oven having a capacity of about 10 tons should be employed. Such an oven consists of a fire-brick shell surrounded by a heating flue wherein the waste gases pass from a combustion chamber under the oven. When the coking process is completed, and while the metallic sponge is in an incandescent state, a strong blast is forced through suitable tuyeres to the interior of the oven, the reduction takes place rapidly and the molten metal and slag are tapped in the usual manner, the oven is then recharged for the next operation.

PATENTS RELATING TO MINING AND METALLURGY

UNITED STATES.

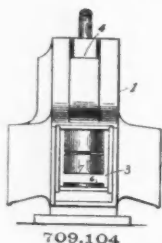
The following is a list of patents relating to mining and metallurgy and kindred subjects, issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the ENGINEERING AND MINING JOURNAL upon receipt of 25 cents.

Week ending September 16, 1902.

709,037. TREATMENT OF TELLURIDE GOLD ORES.—Walter Pethybrigt, London, England. A process for the decomposition of ores containing telluride of gold, consisting in reducing the ore to a finely divided state, then exposing the ore to the action of a solution of ferric chloride of a specific density of about 1.18, and continuing the treatment until the tellurium is in solution.

709,081. MACHINE FOR SHAPING METAL I-BEAMS, CHANNEL-BEAMS, ETC.—William A. Dunn, Smithville, Minn., assignor of one-half to Athol Morton Miller, Duluth, Minn. The combination of horizontal shaping-rolls mounted in a frame, vertical shaping rolls mounted in a frame independent of the aforesaid frame, adjusting-screws for the horizontal rolls, a shaft having gear connection with said screws to rotate them, adjusting screws for the vertical rolls, a shaft connected by multiplying gearing with the screws of the vertical rolls for effecting the adjustment of the latter at a rate of speed in excess of that of the horizontal rolls, gearing between the said shafts, and a single hand-operated clutch in the vertical-rolls-adjusting shaft for checking the adjustment of the vertical rolls at any point during the operation of the mill.

709,104. STAMP-MILL MORTAR.—William A. Merralls, San Francisco, Cal. A stamp-mill mortar provided with stationary means for feeding the ore onto the die from



709,104

the outside inward simultaneously from two opposite directions, whereby the ore is fed evenly upon the die, substantially as described.

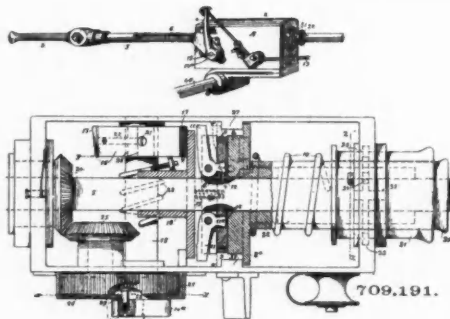
709,112. SLAG-HEATING APPARATUS.—John A. Potter, Philadelphia, Pa. A slag-heater containing an inner vertically extending slag chamber, a shear-blade closing the lower end of said chamber, mechanism for reciprocating said shear blade, and a stop or support below the blade and arranged to support the slag column with a portion thereof protruding below the slag chamber.

709,184. TIN-PLATE-CLEANING MACHINE.—John C. Taliaferro and Charles M. Reynard, Baltimore, Md. The combination with a box or receptacle containing a mass or

body of bran or cleaning material, and having slots or openings at its ends for the sheets to pass through, of cleaning-rolls revolving together in pairs in the body of cleaning material, with a space between the rolls of each pair, and carrying on their surfaces layers of bran or cleaning material in contact with the sheets passing between them and operating to feed and force the sheets forward by the agency of the cleaning material itself.

709,185. PROCESS OF MAKING FERTILIZERS.—Bruno Terne, Philadelphia, Pa. A process of making fertilizers, which consists in treating a phosphate-containing substance with sulphuric acid for rendering the same more fully soluble, simultaneously agitating the mass and adding slowly to the same a concentrated ammoniacal liquor and drawing off the resulting fumes, forcing a current of dry heated air through the mass and simultaneously agitating the same, and finally grinding and pulverizing the mass for use.

709,191. ROCK DRILL.—Russell Avery, Sausalito, Cal., assignor to Avery Drill Company, San Francisco, Cal. The combination in a manually-operated drill, of a casing and a bevel-gear located within the casing through which the drill-bar is guided and slidable, a second bevel-gear mounted upon a transverse shaft engaging the first-named gear, a



709,191.

lever arm exterior to the casing with connections whereby the gears and drill may be turned by the movement of the lever, a cord having one end connected with the outer end of the lever and the opposite end with the person of the hammer-wielder whereby the drill is turned at each backward swing of the body, and a spring by which the lever is returned to its normal position when released.

709,202. SAFETY STOP FOR CONVEYORS.—Peete B. Clarke, New York, N. Y. The combination with an endless conveyor, of a stop arranged to lock the conveyor against backward movement, a support for holding the stop normally out of engagement with the conveyor, and a tripping device adapted to release the stop and arranged to be operated by the backward movement of the conveyor.

709,203. BUCKET FOR ENDLESS CONVEYERS.—Peete B. Clarke, New York, N. Y. A conveyor having pivoted buckets and provided at intervals with cams of different widths, projecting laterally from the buckets different distances, combined with dumping-blocks located different distances from the center of the conveyor and adapted to be engaged by the said cams, whereby the conveyor is adapted to discharge at several points.

709,218. PROCESS OF MELTING NICKEL.—Harry L. Haas, New York, N. Y., assignor to Zucker & Levett & Loeb Company, New York, N. Y. A continuous process of melting and refining nickel containing carbon, consisting in subjecting a column of a mixture of nickel in granular form directly with fuel to heat generated from said fuel; passing large quantities of air under excessive pressure upwardly through the entire column of nickel and fuel, to assure a temperature above the melting point of nickel, and to oxidize the carbon in the nickel; allowing the melting nickel to flow downwardly through the mass and in contact with the air, drawing off the melted nickel with more or less continuity below the column; and supplying fuel and granular nickel as necessary to the top of the column to maintain the temperature and to continue the process.

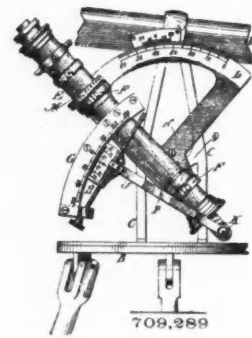
709,268. ALLOY.—Daniel P. James, Eureka, Ill. An alloy consisting of copper, block-tin, nickel, silver and aluminum.

709,277. TREATMENT OF NICKEL AND COPPER-NICKEL ORES.—Camillo Perron, Rome, Italy. A process of lixiviation of poor copper-nickel ores, which consists in the treatment of the said ores in crude or natural condition with sulphide of ammonium.

709,303. CONSTRUCTION OF TANKS.—Edward D. Chester, London, England, assignor to Edward Chester & Company, Limited, London, England. A circular tank constructed of curved side plates, intermediate standards grooved to receive and make joint with the ends of the plates, a floor or bottom having the margin of its upper surface rabbeted to present both vertical and horizontal abutment-surfaces for making joint with the side plates and standards.

709,313. SURVEYING INSTRUMENT.—Thomas T. H. Ferguson, Szechow, near Shanghai, China. In a surveying instrument, the combination of a means forming a flat supporting surface arranged in a vertical plane, a recorder arranged thereon and adapted to maintain a vertical hanging position, and a device for propelling the recorder over the supporting surface in a vertical direction, such device being actuated by the jolting of the instrument.

709,289. MERIDIAN ATTACHMENT FOR SOLAR TRANSITS.—James H. Young, Pensauken, N. J., assignor to Alfred C. Young, Philadelphia, Pa. In a solar transit, a telescope, standards supporting the same, a solar telescope



709,289

suitably pivoted at a point between said standards and moving independently of said first-mentioned telescope, a latitude arc in the form of a quadrant connected and moving with said solar telescope, and a declination-arc suitably connected with said solar telescope and adapted to revolve in a plane outside of the plane of said standards.

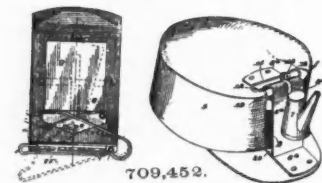
709,321. PROCESS OF SEPARATING SULPHONIC ACIDS.—Ludwig O. Helmers, Hamburg, Germany, assignor to Ichthyol-Gesellschaft Cordes, Hermanni & Co., Hamburg, Germany. A process of separating sulphonic acids into compounds rich in sulphur and compounds poor in sulphur, which consists in converting the sulphonized products obtained by the action of sulphuric acid upon sulphureted hydrocarbons into salts of organic bases and separating the portions of the salts thus obtained which are soluble in water from the insoluble portions.

709,358. PROCESS OF DESULPHURIZING FURNACE GASES.—Emil Pollacek, Budapest, Austria-Hungary. A method for desulphurizing furnace-gases, which consists in passing the gases through a filter arranged adjacent to the fuel-plates of the furnace and formed by the action of the gases upon a mass consisting of lime, sawdust, not-caking fuel, caking fuel and peat.

709,373. COAL-CHUTE.—William H. Taylor, Kewanee, Ill. A coal-chute comprising a bottom portion and side portions pivoted to the edges of the bottom and adapted to be folded down thereon when not in use.

709,420. DREDGING BUCKET.—Charles Pay, Providence, R. I. In a dredging machine, the combination of a bucket consisting of two sections or scoops, each of which has straight parallel sides and also a segmental-shaped bottom, said scoops pivotally mounted on a proper support, bail-arms connected with said scoops respectively at the digging edge of each, and means adapted to operate said arms for the purpose of opening and closing said scoops.

709,452. MATCH SAFE ATTACHMENT FOR MINERS' LAMP-HOLDERS.—James A. Brown, Pictou, Colo., assignor of one-half to George M. Tombling, Pictou, Colo.



709,452.

The combination with a lamp-holder of a match-box pivotally mounted on the inner surface of the holder and provided with a hinged lid and means connected with the lid for opening the same as the box is turned on its pivot.

GREAT BRITAIN.

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

Week ending September 4, 1902.

18,772 of 1901. UTILIZING HEAT OF SLAG.—R. Brown, Southampton. Utilizing the heat of molten slag for drying the ores.

18,833 of 1901. CRUSHER.—M. Archer, Gateshead. In jaw crushers, means of adjusting the distance between the two surfaces.

20,142 and 20,143 of 1901. SULPHURIC ACID PLANT.—R. H. Winsloe and B. Hunt, Manchester. Improvements in sulphuric acid plant, especially in the connecting pipes between chamber and towers, and means for drying the gases and reducing the amount of nitrate used.

20,152 of 1901. COKE CONVEYOR.—R. Dempster & Co. and J. W. Broadhead, Elland, Yorkshire. Improved water-jacketed conveyors for hot coke.

20,472 of 1901. COKE MAKING.—G. de Velna, Paris, France. Method of making coke from anthracite and other coal dust mined with resin or bitumen.

PERSONAL.

Mr. Neil Gillis, of Salt Lake, Utah, has gone to Japan to examine mining properties.

Dr. S. S. Wheeler, of the Crocker-Wheeler Company, has returned to New York City from an extended European trip.

Mr. Llew Humphreys, of Central City, Colo., has been examining mining property in Montana for eastern parties.

Mr. Albert Burch, of Wardner, Idaho, manager of the Bunker Hill & Sullivan Mine, has been in Salt Lake, Utah, recently.

Mr. W. R. Jeffries, of Washington, Ia., has been looking over his mining interests in Ouray and Hinsdale counties, Colorado.

Mr. Thomas Penrose, of Granite, Mont., has been at Silver City, Idaho, investigating properties he owns on War Eagle Mountain.

Col. S. B. Milner, of Salt Lake, Utah, is at the dam site of the Twin Falls Company, 20 miles above Shoshone, on the Snake River.

Mr. William G. Nebeker, of Salt Lake, Utah, has been making an examination of the Japan Mine and workings at Telluride, Colo.

Mr. J. R. Finlay, of Colorado Springs, Colo., the new manager of the Portland Mine at Cripple Creek, was in Butte, Mont., last week.

Mr. A. E. Bruce, who has been connected with the Shannon Copper Company, at Clifton, Ariz., is at his former home, at Riverside, Cal.

Mr. T. W. Brunton, of the Taylor & Brunton Sampling Company, was in Salt Lake, Utah, from Denver last week on his way to Butte.

Mr. Andrew Johns, of Central City, Colo., has gone to California to engage in work for Taylor & Co., the well-known mining experts.

Dr. Haanel, Superintendent of Mines for the Dominion of Canada, recently returned to Ottawa after having paid an official visit to the Yukon.

Mr. H. W. Turner, mining engineer of San Francisco, has been inspecting quicksilver deposits in San Luis Obispo, Monterey and Sonoma counties, Cal.

Mr. H. A. Keller has returned to San Francisco, Cal., after a protracted professional trip in Alaska covering the Kennicott, Mt. Hubbard and Nizina regions.

Mr. A. L. Eaton, assayer at the Penn properties left Leadville, Colo., this week to accept a position on Mr. Sullivan's properties in Chihuahua, Mex., as superintendent.

Mr. B. E. Meredith, of San Francisco, Cal., who is interested in the Wilson & Meredith placer mine on Illinois Creek, near Grant's Pass., Ore., has been visiting the property.

Mr. J. M. Leszynsky, a civil and electrical engineer of New York City, spent last week looking over an electrical power proposition for Leadville, Colo. He declined to discuss the proposition.

Mr. W. G. A. Miller, formerly manager of the ornamental department of the American Bridge Company, has been appointed purchasing agent, with offices at No. 259 South Fourth Street, Philadelphia, Pa.

Mr. Henry A. Judd, mining engineer, formerly well known in North Carolina and Colorado, but now of Kalgoolie, West Australia, has been promoted to Major in the British army, "commanding in the gold fields."

Mr. W. A. Graves, who for several months has been superintendent of the mill of the Fernando Mining Company at Fernando, State of Durango, Mex., has returned to Salt Lake, Utah, on account of ill-health.

Major W. A. Stanton, general manager of the Endora Company's property, near Salmon City, Idaho, has been in Salt Lake, Utah, from a 3 months' stay at camp. A 50-ton cyaniding plant will be added to the company's mill equipment.

Dr. Charles H. Brunner, who has been in Oregon looking after his mining interests, has returned to Salt Lake, Utah. He expected to visit the Consolidated Mercur, at Mercur, in which he is a heavy shareholder, and then go to Colorado.

Mr. Titus Ulke has returned to Sault Ste. Marie, Ont., from a long professional trip, in the course of which he visited copper mines and smelters in British Columbia and Arizona. He also paid a long visit to the district of La Cananea, in Mexico.

Mr. N. S. Clarke, of Victoria, B. C., superintendent of the Yreka Copper Company, of Tacoma, Wash., owning some promising mining properties in the northwest of Vancouver Island, B. C., has been visiting the mines of the Boundary District having open pit workings.

President F. W. McNair, of the Michigan College of Mines, and Dr. John F. Havford, Chief of the Computing Department of the United States Coast and Geodetic Survey, have been conducting experi-

ments at the Tamarack Mine, near Calumet, Mich., to determine the density of the earth.

Messrs. C. A. Andrus, of La Grange, O.; H. H. Fridline, of Ashland, O.; A. B. Lee, C. C. McConnell, of Wooster, O.; William Wegele, of Canal Dover, O.; C. Carson, M. A. Glenn, of Columbus, O., and Dr. Woods, of Mansfield, O., have been inspecting mining properties in Okanogan County, Wash.

Mr. R. B. Watson has opened an office as consulting mining engineer in the Commercial Club Building, Salt Lake, Utah. He will give special attention to mine examinations in Spanish-American countries, the leaching of gold and silver ores and the determination of the most advantageous method of ore treatment.

Mr. H. A. Shipman, who recently resigned as manager of Stratton's Independence, Limited, at Cripple Creek, Colo., has accepted an offer from Bewick, Moreing & Co., of London, Eng., to take charge of the mines of the Cosmopolitan Proprietary Company, Limited, in the Menzies District, 300 miles from Perth, West Australia.

Mr. Henry Bratnober, of Oakland, Cal., who has been connected with many large mining enterprises, both in this country and abroad, is lying seriously ill at a hospital in San Francisco, to which he was removed from his home in Oakland in order to receive special medical attention. Mr. Bratnober is suffering from an affection of the brain.

Messrs. H. M. North, Jr., and P. M. Hoover, of Columbia, Pa., have been in Spokane, Wash., en route to San Francisco. They are interested in mining properties in the Colville District, and spent two weeks in that vicinity examining their properties. Mr. North is the son of H. M. North, one of the principal attorneys for the Pennsylvania Railroad.

Mr. Bernard Macdonald, general manager and consulting engineer of the Le Roi No. 2 and Rosslund-Kootenay mines, is about to make Spokane, Wash., his headquarters instead of Rosslund, B. C. Work at the mines at and near Rosslund under his management will continue under the immediate supervision of Mr. William Thompson, as general superintendent.

Mr. R. J. Cory, manager of the Allis-Chalmers Company's Denver office, has recently returned from Mexico. While there Mr. Cory closed the contract for his company with the Compañía Minera de Penoles for extensive additions to its large smelting plant at Mapimi. The order amounts to some 800 tons of material, consisting of the Wetley roasting furnaces, air compressors, pumps, etc.

Mr. Angus K. Stuart, who was British Columbia Commissioner to the Paris Universal Exhibition of 1900, and had charge of the Canadian mineral exhibit at the Glasgow International Exhibition of 1901, has lately been visiting the Boundary and Kootenay mining districts of British Columbia. He has been appointed collector of exhibits for the Dominion, and will next year make a comprehensive collection for the St. Louis Exhibition of 1904.

OBITUARY.

Dr. F. S. Coburn, vice-president and general manager of the Bonanza Mining and Smelting Company, with headquarters in Washington, killed himself at St. Louis, Mo., on September 29. He shot himself through the head. He is said to have been worth over \$1,000,000, which was largely tied up in his mining ventures in Marion County, Ark. Trouble among the stockholders led to a suspension of all work.

T. Carbet Thompson, accountant for the Crow's Nest Pass Coal Company, Ltd., died at his residence, Fernie, B. C., on September 22, from enteric fever. Apart from his duties as accountant the late Mr. Thompson took an active part in matters affecting his company's interests, notably at the annual conventions in 1901 and 1902 of the Associated Boards of Trade of Eastern British Columbia, at which determined efforts were made to carry resolutions hostile to the company. He was generally esteemed in his business relations and private life.

SOCIETIES AND TECHNICAL SCHOOLS.

MINNESOTA SCHOOL OF MINES.—The University of Minnesota, at Minneapolis, Minn., issues a 34-page pamphlet describing the requirements for admission, students' expenses, laboratory equipment, etc., at the School of Mines. The instruction in mining engineering extends through sophomore, junior and senior years, with field work in surveying preceding the opening of the junior year and field work in mining at the close of that year. The school offers courses in mining engineering, metallurgy and chemistry.

NATIONAL MACHINE TOOL BUILDERS' ASSOCIATION.—This body will meet in Cleveland, O., October 14 and 15, with headquarters at the Hollenden Hotel. The general call and notice for the meeting has been sent out and an invitation extended to all machine tool manufacturers not yet members of the associa-

tion to attend the convention. Joseph Flather, of Nashua, N. H., has succeeded F. E. Reed, of Worcester, Mass., as president of the organization. William Lodge, of Cincinnati, is first vice-president; W. P. Davis, of Rochester, N. Y., second vice-president; P. E. Montanus, of Springfield, O., secretary, and Enoch Earle, of Worcester, Mass., treasurer.

ENGINEERS' CLUB OF PHILADELPHIA.—At the meeting on September 20 there were 47 members and visitors present.

Messrs. Edw. W. Vaill, Jr., and I. Weil were elected to active membership, and Mr. Robert Wetherill, Jr., to junior membership.

Mr. Horatio A. Foster opened a topical discussion on "Depreciation as Affecting Engineered Structures" by reading a paper in which he set forth some of the usual methods of treating depreciation of engineered structures, plant and equipment, and called attention to some other methods that are less used in this country. His remarks were illustrated by diagrams and tables showing the amounts necessary to set aside at interest as a renewal fund to meet the cost of replacing machines, etc. The general subject was discussed by Messrs. Francis Schumann, Henry J. Hartley, W. C. Furber and others.

INDUSTRIAL NOTES.

The Arthur Fritsch Foundry and Machine Company, of St. Louis, Mo., is very busy on mining machinery orders for the West and Southwest.

N. S. Clarke, manager of the Yreka Copper and Development Company of Victoria, B. C., has ordered from the Compressed Air Machinery Company, of San Francisco, Cal., a 10-drill compressor.

The Heine Safety Boiler Company, of St. Louis, Mo., has filed articles increasing the capital stock from \$100,000 to \$430,000. The assets of the company are stated to be \$626,575, and the liabilities, \$183,998.

The Allis-Chalmers Company has shipped the 40-stamp mill for the Bear Gulch Gold Mining Company at Jardine, Mont. The machinery weighs about 250,000 lbs. Fred J. Rowlands, the Allis-Chalmers agent at Butte, made the sale.

The Orford Copper Company, Constable Hook, N. J., has begun work on the buildings for its briquetting plant. An order has been placed with Chisholm, Boyd & White Company, of Chicago, Ill., for a complete equipment of briquetting machinery. The plant will be in operation early in November.

The Colorado Iron Works Company, of Denver, Colo., is equipping the new smelter at Ely, Nev., for the New York & Nevada Copper Company, with briquetting machinery manufactured by Chisholm, Boyd & White Company, of Chicago, Ill. The plant will be completed and in operation about January 1.

The Carnegie Steel Company, of Braddock, Pa., has plans drawn for 2 mills, to be built on the ground purchased at West Homestead, Pa. Work will shortly start. The mills to be erected are an open-hearth mill and an angle mill, and may be the largest of the kind in the country. The site covers many acres.

The United States Silver Corporation, known as the new silver platedware trust, has elected the following officers: President, O. F. Thomas; vice-president, Cephas B. Rogers, and treasurer, E. R. Thomas. The company owns a controlling interest in the International Silver Company, and also in C. Rogers & Brothers, of Meriden, Conn.

The Chapman Fuel Economizing System of Albany, N. Y., has been incorporated to-day with a capital of \$35,000, to manufacture an invention of John S. Chapman for economizing the use of fuel, arresting smoke and increasing steam boiler capacity. The directors are: John S. Chapman, Isaac La Grange, James W. Bentley and B. A. Chapman, of Albany; John Pressley, M. Pressley and M. Weighill, of Rochester.

Steps have been taken for the consolidation of the Wheeling Pottery Company, Riverside Pottery Company, both of Wheeling, W. Va., and the Vance Faience Company, of Tillinsville, O. Each company manufactures a line of ware distinct from the others. The new company, to be known as Wheeling Potteries Company, will be capitalized at \$1,000,000, and Charles W. Franzheim, who is the moving spirit in the enterprise, will probably be chosen president.

The Colorado Iron Works Company, of Denver, Colo., has furnished recently one set 27 in. by 14-in. rolls, 1 set 30-in. by 6-in. high-speed rolls and 3 impact screens, all sectional, for mule-back transportation, to Deutz Hermanos, San Luis Potosi, Mex.; also machinery complete for 40-stamp, 1,000-lb. gold mill erected for operations near the Needles, Cal., for the Mohave Gold Mining Company; and 2 sets of 40-in. by 16-in. latest design belted crushing rolls, for the Economic Gold Extraction Company, of Victor, Colo.

The Eureka Fire Hose Company, of Jersey City,

N. J., has decided to discard its present direct-current power transmission system and to adopt an alternating current system in order to reduce the cost of fire insurance where motors are used in the presence of inflammable material. The new apparatus includes one 75-k.w., belt-driven alternator, furnishing 2-phase current at 7,200 alternations and 220 volts; also exciter, switchboard equipment, slide rails, rheostats, etc. A number of induction motors have been purchased, including 5 of 15 h.p., 1 of 10 h.p., 5 of 5 h.p. and 3 of 2 h.p. With these there will be furnished a switchboard feeder panel, completely equipped with instruments and switches. The entire electrical equipment has been ordered from the Westinghouse Electric and Manufacturing Company.

The Crocker-Wheeler Company held at its works, at Ampere, N. J., on September 25 and 26, its annual managers' convention. At the annual banquet these officers of the company were present: Schuyler S. Wheeler, Gano S. Dunn, W. L. Brownell, Putnam A. Bates, C. N. Wheeler and F. V. Henshaw and these branch managers, Samuel Russell, Jr., Julian Roe, J. Hally Craig, Louis P. Hall, W. H. Wissing, Francis B. DeGrass, Henry J. Sage, William A. Doble and Harold Lomas. During the evening Francis B. DeGrass, of the company's New York office, presented to the general sales manager, Putnam A. Bates, a token of esteem. The purpose of the convention is to bring the men together and give them an opportunity to compare notes and plan methods for handling the growing business of the company.

Chancellor Magie, of New Jersey, has appointed Frank P. McDermott, of Jersey City, and Nathan S. Beardslee, of Warsaw, N. Y., receivers for the National Salt Company. The application for a receiver was made by Chauncey H. Strickland, of New York City. The company's liabilities are given at \$1,150,000 and the quick assets at \$858,000. It is said that the company lost \$225,000 during the first 6 months of the present year, and that it stands to lose \$35,000 a month because of a contract under which the company was to purchase from the Michigan Salt Association and others at a stipulated price about 2,000,000 barrels of salt a year. This contract does not expire until January, 1904. The papers in the case show that the National Salt Company was organized in 1899 with an authorized capital of \$12,000,000, and that the company subsequently absorbed the United Salt Company, which had been its competitor in business in Ohio.

The Buffalo & Susquehanna Iron Company, of Buffalo, N. Y., has contracted with Wm. B. Scaife & Sons Company, of Pittsburg, Pa., for a 6,000 h.p. We-Fu-Go water softening and purifying system, the third plant purchased of the same kind. Wm. B. Scaife & Sons Company now have in successful operation over 200,000 h.p. of water purifying and softening plants in the United States alone, handling over 25,000,000 gals. of water daily, principally for boiler use, although a part of this amount is used in almost every industry where soft water is desirable. Among some of other recent sales are the following: Pennsylvania Salt Manufacturing Company, Wyandotte, Mich., 1,750 h.p.; Hecla Portland Cement and Coal Company, North Bay City, Mich., 1,500 h.p., and at West Branch, Mich., 500 h.p.; Toledo Furnace Company, Toledo, O., 3,750 h.p.; the National Mining Company, Sygan, Pa., 1,000 h.p.; Pittsburg Plate Glass Company, Elwood, Ind., 2,500 h.p.

TRADE CATALOGUES.

The advantages of gas and gasoline engines for light power purposes are set forth in a little 24-page pamphlet published by the Perfecto Gas and Gasoline Engine Company of Philadelphia, Pa. Such engines are recommended for driving pumps, blowers and hoists and for work in blacksmith and carpenter shops.

Robey & Co., Limited, of Lincoln, Eng., in catalogue No. 76, a book of 332 pages, describe their improved whims and portable and stationary hoisting engines, haulage engines, air compressors, head gears, ore cars, skips and cages, mine pumps, stamp mills, concentrating machinery, boilers, engines, wire rope, etc. The catalogue also contains a revised price list.

Gandy cotton-stitched duck belting is described in a little pamphlet issued by the Gandy Belting Company, of Baltimore, Md. This belting, being made of fine-grain specially woven duck, has great strength, traction power and durability. The company claims that its belting is not affected by heat, steam, gas or acid fumes. Numerous testimonials from users are given.

The Bullock Electric Manufacturing Company, of Cincinnati, O., continues to issue its excellent series of illustrated bulletins. Bulletin No. 1002 describes Bullock Type N motors; Bulletin No. 1003 tells about marine lighting and power sets; Bulletin No. 1012 describes direct-current multipolar motors, Type B; and Bulletin No. 1013 treats of direct-current multipolar generators Types H and H-I.

A device for handling materials which attack iron, such as salt and various chemical products, is described in a circular issued by the Robins Conveying Belt Company, of New York City. The device is the Robins belt conveyor, and the pamphlet shows how the belt is used at the works of the Colonial Salt Company at Akron, O., and at the electrolytic works of the Acker Process Company, at Niagara Falls, N. Y.

Triumph pumping engines for railroad use are described in a pamphlet of 16 pages, published by the S. W. Luitwieler Company, of Los Angeles, Cal. This pump is stated to be self-contained, portable, simple and can be quickly set up over any well, either shallow or deep. The pump rods are attached to yokes having hardened steel rollers, and cams of special design working upon these rollers actuate the pump rods.

Ernest Scott & Mountain, Limited, Newcastle-on-Tyne, England, issue a circular of 20 pages on "The Utilization of Electrical Machinery in Coal and Other Mining." It treats of engines for driving generators, electrically driven pumps, coal-cutting machines and hoists and haulage gears. The illustrations are all taken from photographs of plants manufactured by Ernest Scott & Mountain and supplied to collieries in England and other countries.

That important advance in power-transmitting devices, the Renold silent-chain gear, has been on the market in this country not quite a year, but is already in use on a great variety of machinery. The American rights of manufacture are controlled by The Link-Belt Engineering Company and the Link-Belt Machinery Company.

A 12-page pamphlet just issued by these companies shows some of the many purposes for which the chain is now used.

Catalogue C, a little 24-page pamphlet published by William Ainsworth & Son, Denver, Colo., describes the Shattuck double reflector solar attachment. This attachment, which can be used for determining the meridian or latitude with an engineer's transit, or for carrying a traverse line up or down a vertical or steeply inclined shaft in underground surveying, has been described in the ENGINEERING AND MINING JOURNAL, and is recommended for its reliability, simplicity and quick and easy adjustment in the field.

The Climax steam joint trap, the H. H. steam trap, the Butman flue cleaner-rod, the Century gasket cutter and the Century drilling machine are described in a 16-page pamphlet, published by James McCrea & Co., of Chicago, Ill. The company states that the Climax clamp has been adopted by some of the largest plants in the country, and is guaranteed to stop any leaks or joints where the pipe is screwed into the fitting. The H-H trap is simple in construction and operation, and is in extensive use in the West.

High duty pumps and air compressors for the heaviest work are described in circulars sent out by Charles L. Heisler, of Erie, Pa. Mr. Heisler calls attention to the wastefulness of the usual direct-acting steam pump, and gives the results of some tests of a triple-expansion pumping engine of remarkably efficient and simple design. He states that duplicates of an 8 to 10,000,000-gal. pumping engine were furnished during 1901 to the Carnegie Steel Works, the Jones & Laughlin Works and several other large concerns.

Crane Company, of Chicago, Ill., has just issued its new pocket catalogue of 464 pages, which is a handy little book. The book covers the company's complete line of products, including standard, low pressure, medium, extra heavy and hydraulic goods in brass and iron, engineers' supplies, tools, pipe, etc. A copy may be obtained by writing to the home office of the company or to one of the branch houses in New York, the company having branches in New York, Cincinnati, St. Paul, St. Louis, Omaha, San Francisco and other cities.

The Durant counting machine adapted for use on any machine, where an accurate record of the amount of work done is desired, is described in a 36-page pamphlet, published by W. N. Durant, of Milwaukee, Wis. This machine is made of iron and steel, handsomely finished, with interchangeable parts, and is described as accurate, durable and reliable at high speeds. It may be had with various attachments for different purposes, one of these being for measuring linear distances on wood-making machines. The manufacturer also makes a little pocket size hand tally that can be used for hundreds of purposes.

A cloth-bound book of 224 pages, issued by Bowes, Scott & Western, Limited, of London, England, describes that company's mining machinery. The company manufactures wet and dry crushing stamp mills Krom crushing rolls, ball mills, Huntington mills, Blake crushers and handles the Overstrom diagonal concentrator. The firm also deals in woven wire screens, perforated sheet metal, chain elevators, roasting and water jacket furnaces, air compressors, rock drills, Cornish pumps, direct-acting pumps, hoisting

engines for all varieties of work, horse whims, hoisting skips and cages, ore cars, portable railways, drill steel, picks, shovels, vertical and horizontal engines, turbines, water wheels, aerial tramways, etc.

Priestman Brothers, Limited, of Hull, Eng., with offices at 32 Victoria street, London, issues a series of finely illustrated catalogues, describing various products of the firm's works. One of these describes the Priestman excavator and elevator for river and harbor work, and for gold and tin dredging, iron mining, etc. Another pamphlet describes stationary and marine types of the Priestman oil engine. This engine burns kerosene, and has been awarded medals of merit for its reliability of action and the positiveness of its igniting devices. It is now in use by some large mining concerns for hoisting and pumping, while the marine type of the engine has been adopted for launches and yachts and as auxiliary power for sailing vessels.

The Wolf-Keiser turbine, which is made in 2 styles, a standard and a special, is built in 13 different diameters. The standard wheel is built for high heads and scant water supply, and the special wheel for low head with plentiful water supply, where a wheel running at a high rate of speed is desired. Both the standard and special wheels are built in both horizontal and vertical types. The Imperial friction clutch that is stated to be positive and powerful in action, and to combine all the best features that mechanical experience suggest is made in 10 sizes, capable of transmitting from 7 to 350 h.p. at 100 revolutions per minute. Both the Wolf-Keiser turbine and the Imperial clutch are made by the Wolf Company, of Chambersburg, Pa.

Blake-Marsden stone breakers, ore-crushers and pulverizers are described in a 38-page pamphlet sent out by H. R. Marsden, of Leeds, Eng. These crushers are fitted with Marsden's safety-coupling, which prevents breakage of other parts of the machine in case a sledge-head or similar object falls into the jaws. The manufacturer also builds sectional breakers, especially adapted for transport in rough and mountainous countries and high-speed crushing rolls. The jaws of the crushers and the shells of the rolls are made of a special grade of manganese steel, for the manufacture of which a plant has been erected. The second part of the catalogue deals with complete stone and slag-crushing plants and plants for crushing copper, gold and other ores.

The Challenge Wind-mill and Feed-mill Company, of Batavia, Ill., issues a general catalogue of 144 pages, describing its galvanized steel wind-mills and steel towers. The wind-mills are made for all work from the lightest to the heaviest, and have been erected in many parts of the United States and in foreign countries. The company states it has been in the wind-mill business for over 36 years, has agents all over the globe, and now uses the largest galvanizing plant in the world, galvanizing 40,000 lbs. of steel per day. All the company's steel mills and steel towers are galvanized after completion, greatly increasing their durability. The company also makes gasoline engines, pumps for domestic purposes, pipe and hose fittings, artesian well supplies, etc.

Edward Chester & Co., of Renfrew, Scotland, with head offices at 120 Bishopgate street, Within, London, have issued a series of catalogues describing the products of their works. These catalogues contain considerable information of value to mining men and are out of the ordinary run of trade publications. Catalogue No. 1 treats of the reduction of gold, silver and copper ores, and is in no sense a price list, but a general description of reduction processes. It contains tables of gold, silver and copper production and an interesting chronology of gold and silver mining from 1442 to 1892. Catalogue No. 2 gives much detailed information about stamp mills for gold and silver ores. It contains some useful tables, and like the preceding catalogue is a treatise rather than a price list.

Overhead tram-rail traveling cranes, elevating and conveying machinery are described in an illustrated 6 by 9-in. pamphlet of 144 pages, sent out by J. W. Moyer & Co., of Philadelphia, Pa. This company's business was established in 1890, and the growth to present proportions has been due, the company says, to the uniform high quality of its products. The Moyer overhead tramway system has been installed in many important industrial works, such as the plant of the Pacific Coast Borax Company, Bayonne, N. J. The various details of this system are described and the prices of parts given. The company makes also Moyer elevators, conveyors and carriers, electric power trolleys, portable derricks, differential pulley blocks and chain hoists, including the Yale-Western triplex blocks, also the Moyer electric hoists for suspended trolleys, also coal-hopper scales and traveling cranes.

What is claimed to be a distinct advance in belt conveyors is described in a 24-page pamphlet, published by the John A. Meade Manufacturing Company of New York City, a company which builds and erects labor-saving machinery for handling any

type of material, and makes the Ridgway patent belt. The peculiar merit claimed for this belt is that it has flexible edges, several folds of the canvas body of the belt being replaced by rubber toward either side. This gives flexibility at the points where the belt hinges or is flexed by the carriers, ensuring durability at a weak point. Another merit of this conveyor is that the side and bottom pulleys, instead of having axles in the same vertical plane are set staggering, and the carrying pulley has a larger diameter than the side pulleys. By this arrangement, it is claimed, the belt runs easier, and there is no sharp corner between the horizontal and angle pulleys into which the belt may be forced.

Hunt cable railways, manufactured by the C. W. Hunt Company, of West New Brighton, Staten Island, N. Y., are described in a neatly illustrated 20-page catalogue published by the company. These railways are intended for handling coal or merchandise, and have been installed at some large power stations and industrial plants. The company states that it has been in its special line of business for 30 years, and its coal-handling machinery is in use in almost every port in America and every country of the globe. It has now ample shop room, and by manufacturing its own machinery controls both the quality and workmanship. The company designs and makes plans for all classes of wharves, trestles and storage buildings for storing coal, ore and similar materials. The company builds 3 varieties of cable railways—heavy cable railways, with constant running cable, and cars attached at any point, double shuttle railways using 2 cars passing on a switch or double track and single shuttle railways using but 1 car.

The Billings & Spencer Company, of Hartford, Conn., issues a series of catalogues illustrating its machinist tools, drop hammers and drop forgings. The list of machine tools described in a pamphlet of 92 pages embraces taps and dies, plyers, wrenches, clamps, ratchet drills, screw drivers, calipers, gauges, hammers and vises. The company states that its tools are all finished in a thorough manner, the aim being to produce the best both in quality of material and workmanship. The company has long been known for its wrenches, and the present catalogue contains some new patterns of machinists' wrenches to fit square and hexagon nuts and square head set-screws. The company also states that its drop-forging department now offers increased facilities for furnishing drop forgings promptly and cheaply. Forgings for electrical work from pure copper and bronze are a specialty, and the company issues a 30-page illustrated pamphlet describing its drop-forged pure Lake copper commutator segments for all standard street railway motors.

GENERAL MINING NEWS.

Engineering Company of America.—This company has been incorporated, with headquarters in New York city, to do any and all kinds of engineering work. Its staff is to contain men of ability covering every branch of technical and commercial operation, including mining, hydraulics, chemistry, metallurgy, civil engineering, railroad engineering, and forestry. Frank C. Smith is president of the company, Joseph Hyde Pratt secretary and August Roesler treasurer.

ALABAMA.

JACKSON COUNTY.

Alabama Coal Land and Mineral Company.—This company controls 3,000 acres of timber and coal land near Scottsboro, and is reported negotiating for 980 acres more. The company is capitalized at \$500,000. The officers are Isaac F. March, of Birdsboro, Pa., president; Milford N. Potter, of Reading, Pa., secretary and treasurer.

ALASKA.

(From Our Special Correspondent.)

Aurora Gold Mining Company.—This company, at Cook Inlet, has 40 claims about 6 miles from Homer. Buildings have been put up, tramways built, electric plant installed, a 30-stamp mill, Cornish rolls, etc., supplied. The machinery is idle, and some of it has never been unpacked. It is stated that an expert has reported that there is no ore of any value in the company's holdings.

Coal Deposits.—W. G. Attwood, chief engineer and topographer of the Alaska Central Railway, reports an extensive coal-field on the Catwell River, about 30 miles south of the Tanana River.

Nazina Diggings.—These diggings, in the Copper River Valley, 200 miles inland from Valdez, have several rich claims, especially on Rex Gulch. About 400 claims have been staked in the district, of which Robert Blei, of New York City, owns the majority. Bed-rock is found at from 4 to 6 ft.

CAPE NOME.

(From Our Special Correspondent.)

Nome River & New York Hydraulic Gold Mining Company.—This company is digging a 15-mile ditch

from a point opposite the mouth of Hobson Creek on Nome River, to the mouth of Dexter Creek. The ditch will not be finished until next season, and will be the largest in the Nome region.

Tin.—The Nome tin claims do not seem to pan out as well as expected. Some stream tin has been found, but no very large amounts have been reported.

DOUGLAS ISLAND.

(From Our Special Correspondent.)

Frank M. Stone, representing New York City capital, has purchased the Alaska and 12 other lode claims on Nevada Creek, and has started development. The ledge is said to be a big deposit of low-grade ore.

ARIZONA.

MOHAVE COUNTY.

(From Our Special Correspondent.)

Cyclopic.—A. R. Robbins, superintendent of this mine, in Gold Basin, reports that the company intends to complete the purchase of the group from R. G. Patterson on or about November 1.

Elkhart.—This mine, at Chloride, is doing a little stoping preparatory to total abandonment. The machinery of the 100-ton concentrating plant, together with all the buildings and other surface improvements, are being sold to various buyers.

Gold Roads.—It is reported that Prince Padraza has been visiting this mine at Gold Roads. He is one of the new European owners. He is to look over the plans for a reduction works and railroad from the mines to the main line of the Santa Fe Pacific at Franconia.

San Francisco.—This mine, at Cedar Valley, has a small force at work.

YAVAPAI COUNTY.

Congress.—This gold mine, at Congress, has been purchased by the Development Company of America, which floated the Tombstone Consolidated Mines Company. The Congress is a well-known gold mine, and has been developed by over 20 miles of underground workings. The concentrating mills are equipped with 80 stamps, with a capacity of about 300 tons per day. The company has a cyanide plant, equipped with modern appliances and ample leaching and solution tanks.

White Cloud.—This mine has a shaft down some 200 ft., and is still sinking. It is well equipped with gasoline engines, hoists and a stamp mill. The mine is owned by the Picacho-Blanco Mining Company of New York City. Richard Eames, Jr., of Salisbury, N. C., is consulting engineer.

ARKANSAS.

BAXTER COUNTY.

(From Our Special Correspondent.)

Rex Mining Company.—On one property this company has 2 prospect shafts down 20 ft in ruby jack. On the Cincinnati a shaft is down 13 ft. in ruby jack, with 30 tons on the dump. In the Commercial a shaft is down 30 ft. in good blende. On the Floto lease an 18-ft. shaft has cut a 3-ft. run of pay ore, principally ruby jack.

White River Mining and Development Company.—The Bald Dave shows jack and carbonate outcrops. The Hopeful has 3 open cuts showing good jack.

MARION COUNTY.

(From Our Special Correspondent.)

The Presler-Crawley Company of Cincinnati, O., is making tests with a core drill.

Bonanza.—Former shipments from this mine, at Cow Creek, aggregated 100 tons.

Holy Moses Mining Company.—The Eldorado property has 4 cuts and 4 shafts, averaging 18 ft. each, showing blende; 150 tons of ore are on the dumps.

SHARP COUNTY.

(From Our Special Correspondent.)

White River Mining and Development Company.—This company has a 1,000-acre block of land, and has 7 open cuts in jack, while 1 shaft is down 28 ft.

CALIFORNIA.

ALAMEDA COUNTY.

(From Our Special Correspondent.)

Yellow Metal Mining and Reduction Company.—This company has been incorporated with the object of building smelting works in Oakland. The directors are H. Lancaster, L. Cooper, Alex. McGeoch, G. H. Bennett and J. E. Shettle.

AMADOR COUNTY.

(From Our Special Correspondent.)

Amador-Phoenix.—Drifting continues in this mine, near Jackson.

Bay State.—On this mine, at Plymouth, the 10-

stamp mill continues steadily, crushing ore from the 7th and 8th levels.

Bunker Hill.—In this mine, at Amador City, C. R. Downs superintendent, a body of pay ore has been found in the north 200 drift, 700 ft. from the shaft. A mill is to be built in the spring.

Mitchell.—Report says that this mine at Pine Grove, L. C. Hyner superintendent, will soon begin work under new management. More development underground must be done before the mill can start.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

Fannie-Marie Mining Company.—In the mine, at Glence, Charles H. Blake superintendent, the ore bins are finished, and grading for the new mill is nearly done. At the Blue Jay Mine, near Mokelumne Hill, the electrical power has been turned on, and the air drills are in use. Twenty men are busy.

New Schleswig.—At this mine, near Mokelumne Hill, W. H. Curnow superintendent, the old shaft is being re-timbered. The company will have a steam hoist, etc. The mine has been idle some time.

Oriole.—On this mine, at Angels, F. E. Dunlap manager, a 10-stamp mill is being erected.

Sierra Railway Company.—Angels Camp is now connected by rail with the outside world by this road over the newly built branch.

DEL NORTE COUNTY.

(From Our Special Correspondent.)

Beach Mining.—W. W. Burgemester has bought part of the Elk Valley ranch, below Crescent City, from Samuel Dowdie, and is putting in a plant for beach sand mining. The sand pump is to handle 120 tons of black sand daily.

EL DORADO COUNTY.

(From Our Special Correspondent.)

Lucania.—The new water system for this mine, on the American River, near Sportsman's Hall, is completed. The water is conveyed from the river 1½ miles to the mill.

KERN COUNTY.

(From Our Special Correspondent.)

Miners' Strike.—The miners' unions at Randsburg and Mohave decided to order a strike on October 1, and to demand re-instatement of certain men recently discharged. Car men and shovelers want an increase from \$2.50 to \$3 per day. There has been friction between mine owners and miners for some time. About 1,000 miners are involved.

Consolidated Mines Company.—This company is driving a cross-cut tunnel through Rand Hill, at Randsburg, in the hope of striking several ledges.

Iron Ore Deposits.—Deposits of iron ore have been found on the line of survey of the Midland Pacific Railroad from Bakersfield to tidewater.

Keys.—In this mine, at Keyesville, development continues. A deep drainage tunnel is contemplated.

Mohave Mining District.—Thompson & Boyle have purchased from N. Crow 3 claims in this district. C. C. Calkins and C. E. Potter have opened good ore in the Accident and Revenue claims, and are preparing to bring in water. The Exposed Treasure has piped water 15 miles. The Echo Mining and Milling Company has installed a 40-ton Elspass mill, and has bought the Gray Eagle, Gipsy and Evening Star claims.

INYO COUNTY.

(From Our Special Correspondent.)

Inyo Gold Company.—This company has been incorporated to work this group, near Panamint. The incorporators are W. S. James, F. P. Flint, O. P. Widaman, G. W. Lasher and J. O. Scannel, of Los Angeles. The company has a 12-stamp mill.

Reward.—Superintendent H. C. Steele, of this mine, at Reward, has contracted with the Union Iron Works, of San Francisco, for a 20-stamp mill. An electric power plant is to be put in.

Sweetwater.—At this group of 9 claims, near Bodie, A. P. Sayre, superintendent and J. A. Brown general manager, the new 10-stamp mill and 50-ton cyanide plant are busy. Several veins are worked through tunnels. Twenty men are employed.

NEVADA COUNTY.

(From Our Special Correspondent.)

Bullion Consolidated Gold Mining and Milling Company.—This company, at Grass Valley, George Mainhart manager, has the 3-compartment shaft on the Bullion down 1,150 ft., with levels at each 100 ft. There is a 10-stamp mill, hoist, pump, etc., with both electric and steam power plant. Forty men are employed.

Coe.—At this Grass Valley mine, J. B. Lakenan superintendent, the 20-stamp mill is ready to start with 1,000 tons of ore stoped out.

Crown Point.—The buildings are being torn down,

the mine now being owned by the Empire Mines Company of Grass Valley.

Idaho Gold Mining Company.—A new company is being incorporated to work the South Idaho Mine, at Grass Valley, which has been idle some time. Those who are organizing the company are John E. Carter, Jacob H. Neff, Julian Sonntag, C. E. Clinch, P. W. Mitchell, Richard Nowell and J. M. Thomas. The shaft is to be unwatered.

Shady Creek.—This old mine, in Grass Valley District, which has been closed for 30 years, has been bonded by Clifford Graham, and miners will soon be at work. The mine was once a producer.

PLACER COUNTY.

(From Our Special Correspondent.)

Cambridge.—H. J. Stemple, of this mine, near Yankee Jims, is busy cleaning up Shirt Tail Canyon.

Herman.—In this mine, at Westville, an upraise is being made from the lower level.

Zcibrigt.—W. F. Englebright, Fred Zeitler and other Grass Valley men are interested in this mine, near Dutch Flat. Four men are at work, but the force is to be increased and a mill built. The ore is said to run about \$15 per ton.

PLUMAS COUNTY.

(From Our Special Correspondent.)

New York.—This mine, near Greenville, has been sold to J. D. Whitney and associates for a reported price of \$30,000. A new mill was put in this summer.

SAN DIEGO COUNTY.

(From Our Special Correspondent.)

High Peak.—This mine and the Helvetia, at Julian, are employing 15 men and keeping the mill running.

SHASTA COUNTY.

(From Our Special Correspondent.)

Bully Hill Copper Company.—This company has filed application for patent to the Monogram claim in the Pitt River region. W. C. Bruson has filed a contest alleging ownership and protesting issue of the patent.

Graphite.—J. C. Frick, of Shasta, and Bemis Bros., of Redding, are opening a graphite claim near Shasta, and have a tunnel in 150 ft. The only graphite property worked in California is near Petaluma, Sonoma County.

Mount Shasta Gold Mines.—In the mine at Shasta, F. E. Ware manager, the shaft is re-timbered and ore is mined. A drift will be run from the 350-ft. level. At the Summit group the force of miners is to be increased.

SIERRA COUNTY.

(From Our Special Correspondent.)

New Independence.—In this mine, near Gibsonville, where Wm. Simmons succeeds C. M. Root as superintendent, 16 men are busy. The old 8-stamp mill is being used until the new mill is completed. Machinery is being shipped in. Work is underway on the 3d level, where the ledge is 7 ft. thick.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

Herr Coal Mine.—A new crew is to start work again at the coal mine on the Herr ranch.

Indian Girl and Edson.—At these mines, near Hornbrook, A. M. Williams has a 2-stamp mill and Standard concentrator, with gasoline engine for power.

Whip & Loud.—This group of 6 claims at Cherry Creek, near Yreka, recently bought by George Vernon Gray, employs a good force of men. Development only is being done. The group will hereafter be known as the Mount Vernon. Mr. Gray will erect a mill if developments warrant.

SONOMA COUNTY.

(From Our Special Correspondent.)

McMillen Silver Mining Company.—At a recent meeting at Santa Rosa the following officers were elected: W. F. Holmes, president; A. G. Burnett, vice-president; Charles A. Hoffer, secretary; J. P. Overton, T. B. Hood, Jacob Wheeler and J. T. Campbell.

Petaluma Oil Prospects.—The Biggins and Champlain ranches east of Petaluma, have been bonded by parties who are boring for oil.

Socrates.—George M. Pinney, Jr., has filed a suit against Frank A. Huntington and others, owners of $\frac{3}{4}$ of this quicksilver mine in Cinnabar District. The complaint alleges that the defendants deeded to W. B. Carr their interests in trust for \$110,000 to enable Carr to sell the property. Carr failed in this, and on his death Huntington was appointed trustee. Geo. M. Pinney, Sr., owned an interest which he conveyed to Geo. M. Pinney, Jr., and the latter claims that Huntington refuses to convey his part, and asks the court to order the transfer. The share claimed amounts to \$10,000, which would give the mine a value of \$600,000.

TEHAMA COUNTY.

(From Our Special Correspondent.)

Platinum.—David Musser, of Bee Gum, is getting considerable platinum in his placer claim, the platinum values being about equal to the gold.

TRINITY COUNTY.

(From Our Special Correspondent.)

Compagnie Francaise des Placers Hydrauliques de Junction City.—The mines on the Trinity River, near Junction City, have closed for the season, and will probably not be worked again unless more ground can be acquired. This is one of the famous hydraulic companies of California. Though the ground was worked by sluicing and small nozzles prior to 1878, it was not systematically opened until then, and not until 1883 were ditches dug and the claims ready for turning on water. This preliminary work cost upward of \$170,000. The ground until 1893 was owned by Dr. A. H. Hayes, of Boston, Mass., who sold it for \$280,000 to the present company having headquarters in Paris, France. A siphon 2,212 ft. long of 42-in. pipe crosses the McGillivray Divide. To carry the pipe line across the Trinity River a suspension bridge, costing \$40,000 was built. The ditch up Canyon Creek is about 10 miles long. The company had over 3 miles of mining ground along the river, the banks being from 40 to 150 ft. high and not old river channels. The gravel during many years has averaged about 6c. per cu. yd. from top to bottom. In about the first 3 years the company took out the cost of the property, which has since been very profitable. Practically all the profitable gravel has now been worked out. The company has a very complete plant, electric lights, 12 giants, etc.

Gold King and Stoddard.—Title to these mines, in Cinnabar District, is in dispute. Charles Hilton and George W. Mixer have sued J. R. Stoddard, G. H. Blagrove, J. L. Morrison and W. C. Cooper for trespass, and suit is pending.

Three Peaks Mining Company.—The group of 17 claims, near Abrams, is now owned by a company having these officers: F. F. Primm, president; S. A. Chambers, vice-president; D. G. Brake, secretary, and J. J. Chambers, manager. The manager says a mill will be at work very shortly.

TULARE COUNTY.

(From Our Special Correspondent.)

Minnie-Ellen.—C. F. Cox, of San Francisco, has taken an interest from Frank Cook in this mine, 7 miles from Porterville, and bought machinery to work it. A small mill will be used at first.

YUBA COUNTY.

(From Our Special Correspondent.)

Commonwealth.—This mine, at Brown's Valley, has been sold to Julian Sonntag, of San Francisco.

COLORADO.

GILPIN COUNTY.

(From Our Special Correspondent.)

Mining Deeds and Transfers.—Hugh J. Williams to S. T. Harris, $\frac{1}{4}$ interest Randolph extension lode, Russell District; J. B. Ross to John Ross, the Delmonico lode, Illinois-Central District; G. C. Ray to R. W. Ray, $\frac{1}{4}$ interest, Yellow Medicine, Broker, Gold King and Home Stake lodes, Pine District; B. Todd et al to George O. Mead, 1-5 interest in Emma and 6 lodes, Pine District; W. D. Nash to Henry Bear, 1-7 interest in U. S. S. Illinois group of 7 lodes, Wisconsin District; W. R. Backus to T. H. Potter et al, the W. H. Cochran and 6 lodes, Independent District; D. C. Officer to W. Johnson, Sea Bird group of 5 lodes and Ada placer claim, Pine and Independent districts; John H. Servis to the Rockdale Mining Company, the Wood lode, Russell District; D. Wood et al to H. A. Hicks, the Hope and Croesus lodes, Russell District; George Stroehle et al to the New National Tunnel Company, the Caledonia and Horseshoe lodes, Gregory District; H. A. Campbell to the Benzie Investment Company, the Straub, east 250 ft. of the Astabula lode, Press & Straub extension lodes, Eureka District; J. Brohl to the Four-Mile Gulch Tunnel Mining Company, the Mary Tract, Enterprise District; H. S. Waldo to A. J. Simonson, $\frac{3}{4}$ interest British lode, Illinois-Central District; W. R. Backus et al to W. K. Louis, the Yahoo, Revenue and None Such lodes, Gregory District; C. W. Baldwin to the Four-Mile Gulch Tunnel Mining Company, the Prince Henry group of 9 lodes and tract A, Enterprise District. R. M. Leming to A. Ashbaugh, 1-3 interest Deadwood placer, So. Boulder; Vendome Gold Mining Company to H. C. Bolsinger, et al. the west 1,500 ft. of the Shafts lode, Nevada District; J. B. McKay, to W. McKay et al, 3-12 interest in National lode, Central District; B. S. Lake to John Sparks et al, east 200 ft. of Jones lode, Nevada District; Francis B. McLeod to the Notaway Mining Company, easterly 900 ft. of Notaway lode, Russell District; L. B. Hail to Allie Simonson, the British lode, Lake District; M. T. Stright to B. F. McCann

et al, 5-6 interest in Winthrop Tunnel and tunnel site, Wisconsin District; M. S. Morre to the Nevada Consolidated Gold Mining and Milling Company, the Mignon, Mary A., Claudia, George I., Paul and Mollie lodes, Nevada District.

Bates.—A 40-h.p. boiler is being installed at this mine in Gregory District, and arrangements for cleaning out the shaft are underway. First-class ores have been taken out. The mine is worked under lease by Henry Becker, of Central City.

Electric Spark Gold Mining Company.—This company, in which Omaha men are interested, is working the Grace Darling group of claims in Lake District. A new shaft-house 20 by 40 ft. is being erected, and a medium-sized plant of machinery installed. The company will sink several hundred feet deeper. J. C. Martin, of Black Hawk, Colo., is manager. Some good grade surface ores have been shipped to the Golden Smelter.

Gunnell Mining and Milling Company.—Owing to a break down the company will be compelled to replace one of its engines running the Cornish pump. About 75 men are busy, a large number being on leasing account, and the daily product ranges from 60 to 75 tons, most of it going to the stamp mills. Some good-looking copper ores have been found in the 1,200 ft. level of the Gunnell. Frank Young, of Central City, is in charge.

Ohio.—Waldhardt & Kurri, operating this property in Vermilion District, received values of nearly 10 oz. gold per cord for ores shipped from the tunnel to the local mills this week. J. Waldhardt, of Black Hawk, is manager.

Ophur.—A 50-h. p. friction engine and a 50-h. p. boiler have been received at this mine in Nevada District, and a shaft building 24 by 50 ft. will be erected. The shaft has been retimbered for 650 ft., and is to be cleaned out the entire depth of nearly 800 ft. Denver parties are the lessees, with W. Parenteu, of Central City, in charge.

Sutton Mining Company.—The following directors have been elected: G. W. Wright and C. S. Hazlewood, of Chicago, Ill.; Chase Withrow and H. F. Pool, of Central City, and J. F. Perkins, of Bald Mountain. The company has bought out interests in the Alva Adams group of 9 claims, and the members are interested in the Notaway Mining Company, which has a lease on the Alva Adams group. H. F. Pool, of Central City, is superintendent.

Waltham Mining and Milling Company.—The capital stock is \$30,000, and M. W. Tanner, G. Carlson, A. Anderson and R. H. Hastie are the majority of the board of directors. The company is working the Waltham Mine, in Russell District. R. H. Hastie, of Nevada, is in charge.

HINSDALE COUNTY.

Megunticook Gold and Copper Mining Company.—At the annual meeting in Lake City directors were elected as follows: William R. Lincoln, Brunswick, Me.; William E. Lamson, Randolph, Vt.; A. S. Wallace, Nashua, N. H.; Henry W. Whiting, Groton, Mass.; H. Wixon, Providence, R. I.; H. P. Crawford, Boston, Mass.; P. G. Dawson, Lake City, Colo. The new directors are largely interested in the company, and will endeavor to straighten out its somewhat tangled affairs and resume operations.

LAKE COUNTY—LEADVILLE.

(From Our Special Correspondent.)

Leadville Ore Output.—The production for September of all classes of material amounted to about 63,000 tons. The increase is due largely to the heavy shipments of zinc sulphides and tailings from the Moyer and Moyer dump.

A. Y. & Minnie Mill.—This new mill, owned by the company headed by Nicholson & Rodman, is running full capacity, and shipping 100 tons daily of lead and zinc concentrates.

American Smelting and Refining Company.—The company is increasing the capacity of the Arkansas Valley plant so as to handle more of the lower grade ore. Of the 8 new reverberatories 3 are already in operation, thus easing up the sulphide situation somewhat. Two of the smaller furnaces are being replaced by 100-ton furnaces, so that by December 1 the plant will be handling 28,000 tons of raw material a month.

Banker Mining Company.—This gold belt property, on Breece Hill, in which New York and New Jersey people have expended a large sum of money, has opened several low-grade gold ore bodies in addition to some rich streaks. Manager John Guth has returned from New York City, and states he has the necessary capital to open the Banker Mine, and will arrange at once for erecting a concentrating mill.

Gold Basin Mining Company.—The new shaft on the old Big Four ground is down 400 ft., where ore is being broken in the drifts. The pay streak varies from 2 to 6 in., and averages 4 to 10 oz. gold, 90 oz. silver and 3 to 5 per cent copper. The company believes it has the extension of the Big Four shoot.

Ibez Mining Company.—Shipments are 250 to 300 tons a day of siliceous and oxidized ore. A large amount of new development is under way.

Morocco Mining Company.—Manager Schlessinger has lowered the water through the A. V. shaft to the first level, and is after a known iron ore body. The company will soon be shipping steadily.

New Leadville Home Mining Company.—While the company is shipping 150 tons daily from its Penrose workings, it has also several blocks of ground under sub-lease. One of these, on the Penrose, operated by J. D. Evans, shows a very rich strike at 580 ft., a chloride body 18 ft. wide and 40 ft. long, averaging 125 to 500 oz. silver, with some assays going 1,000 oz. Mr. Evans is also shipping 50 tons a day of fair grade iron.

Penn Mining Company.—Shipments are continuous at 50 tons daily from a medium grade siliceous body. The efforts to locate the sulphides with the diamond drill were unsuccessful.

President.—H. Gaw and others, owners, working this gold belt property, have large bodies of low-grade siliceous ore opened, and are pushing new drifts into virgin territory.

Reno.—The vein recently uncovered is 3 ft. wide, and assays well. A new pumping plant has been put in.

Rocky Mountain Smelting Company.—R. S. Billings, representative, says the company is being reorganized on a strong basis, and that arrangements are being made to blow in the plant at Florence.

Two Bit Mining Company.—Shipments are made from a gold and copper vein caught in the drift from the new shaft. It is being developed in virgin ground.

OURAY COUNTY.

Bankers' National Mining Company.—This company, of Denver, has men at work on its group in the Sneffels District under C. H. Babcock.

Camp Bird, Limited.—This company, at Ouray, is extracting about 200 tons of ore daily through 3 tunnels, the lowest of which is at an altitude of 11,300 ft. The veins worked average about 7 or 8 ft. wide, the vein filling being quartz in some places, so much as to be mined very easily, and containing much clay and talc. The ore goes from the mine to the mill over a Bleichert tramway, erected by the Trenton Iron Works Company, the standing cable of interlocked wires being about 10,000 ft. long. At the mill the ore is screened by grizzlies and the coarse passes through 9 by 15 crushers. From the ore bins automatic feeders pass the ore to the 60 stamps, weighing 850 lbs. each, running at 100 drops per minute, with 6-in. drop and 4-in. discharge. The screens are 26-mesh of No. 29 wire. The pulp passes over copper plates 16 ft. long, then over a shaking trap, and the plate tailings go to concentrators after being classified in V boxes. There are 35 concentrating tables. The tailings go to a hydraulic classifier; the coarse go to a Huntington mill and are reground and reamalgamated and the tailings concentrated. The tailings from the stamp mill run to the cyanide plant, which is arranged for both single and double treatment, a single treatment taking about 13 days and the double treatment about 9 days. Four pounds of cyanide to the ton of water are used. The slimes from the cyanide vats run into a tank and are treated by cyanide in agitation vats. Filter presses are being introduced.

Des Ouray Consolidated Mining Company.—This new corporation has been formed with a capital stock of \$1,000,000. The incorporators are W. A. Spurrier, president, Des Moines, Ia.; vice-president, F. D. Catlin, Montrose; secretary, C. F. Forbes, Des Moines, Ia., with G. W. Mattern, George L. Tate, W. L. Read, of Des Moines, Ia., and L. G. Clark, of Montrose, directors. The headquarters will be in Montrose and the object is to work the Republican, Virginia Bell and about 25 other claims adjoining.

Pickett.—This mine, in Poughkeepsie Gulch, which was sold last week by George T. Bradley to Eastern men for a reported sum of \$40,000, has now a boarding house and other buildings and is making preparations to work this winter. A force of 7 men is employed under the supervision of Mr. Bradley.

SAN MIGUEL COUNTY.

(From Our Special Correspondent.)

Alta Mines Company.—The reconstructed mill has started after being idle for 6 weeks. Its capacity is considerably increased. A great amount of development has been done in the mine, and the showing is very good. A. C. Kock is superintendent.

Butterfly-Terrible.—The leasers of this mine, located near Ophir Loop, cleaned up \$4,300 during August. They employ about 15 men, and keep 15 stamps dropping. The mill cross-cut tunnel is in 1,950 ft., and will go 300 ft. further to cut the veins 900 ft. below the lowest of the upepr workings. D. J. Sayers is manager.

Crown Point Mine No. 2.—J. K. Hathorne has leased this mine from the Milwaukee-Ophir Mining Company, and is pushing development. Some ore

shipped gave smelter returns that were satisfactory. The mine is near Ophir.

Japan Mines Company.—The lower cross-cut tunnel was driven 238 ft. during August, averaging over 7 ft. per day. It may be driven 250 ft. this month. The Japan holds the record for tunnel driving in the San Juan country, as the monthly average since operations were resumed has been over 200 ft. The bore is being driven through trachyte. Walter Beam is manager.

Keystone Hydraulic Mining Company.—This company, working the big placer, 5 miles west of Telluride, has closed down the hydraulic giants. Owing to the coming winter and a possible shortage of water, a tunnel will be driven to the gravel bank, instead of using an open cut. The tunnel will be 8 ft. by 7 ft. and 400 ft. long and about 60 ft. below surface. It is expected that it will be completed before March. Sluices will be laid, and everything will be ready to start work March 15, provided there is an ample supply of water. A clean-up will be made within 10 days. C. M. Coleman has charge.

Nellie.—Development in this mine, in Bear Creek Basin, goes on vigorously, and 20 stamps in the mill are dropping steadily. As soon as more ground is opened 20 additional stamps will start. Cooper Anderson is manager.

Ophir-Consolidated.—The old part of the Silver Bell Mill, at Ophir, is started after a shut down of nearly 2 months, pending the completion of the new addition, but as some of the machinery has not been received it was decided to run 20 stamps and start the entire mill as soon as possible. W. S. Buckley is manager.

T. E. Thomas Group.—This group of 6 lode claims, 2 mill sites, water right and mill, owned by T. E. Thomas, ex-Governor Alva Adams and Frank Adams, has closed down. The Adams bought out Thomas' right for \$2,000.

Telluride Coal Mining Company.—The tunnel on the vein of coal, 1 mile west of Telluride, has been driven 500 ft., and a 6-in. ventilating pipe is being put in. Some coal will be mined this winter, and next spring a tramway 2,500 ft. long will be erected from the mouth of the tunnel to the railroad. A. L. Nathan is manager.

TELLER COUNTY—CRIPPLE CREEK.

(From Our Special Correspondent.)

Drainage of Deep Levels.—A number of prominent mining men met during the week at Colorado Springs to discuss pumping at the mines. This is getting to be rather a serious question in the Cripple Creek District, and a number of remedies have been suggested. A number of drainage tunnel propositions were submitted at the meeting, and a committee of five was appointed to investigate the question, consider the plans suggested and report at a later date. Those appointed were: F. F. Castello, William Lennox, Sherwood Aldrich, William Bainbridge and F. G. Peck.

Empire State Gold Mining Company.—A deed was filed in the County Clerks' office this week conveying to the Empire State Mines Company the property of this company. The consideration as named was 1,750,000 shares of the Empire State Mines Company's stock. The property transferred consists of the Orphans 1 and 2 and the Ida Bell 1 and 2 as well as other property.

Mary McKinney Mining Company.—It is understood that this company has followed the example of the Elkton, and temporarily stopped pumping in the 6th level. No mining has been done on this level, so production is not affected. It is also understood that a large new pump has been ordered, but will not arrive for some time. Recently the company has been pumping to full capacity. The property is near Anacoda; and it probably has the longest continuous ore shoot in the district.

Mineral Hill.—Quite a little work is being done on the Addie C. property, adjoining the Laura Lee, where a rich strike was reported some time ago, but did not hold out. The Jennings Brothers are working the Sun Flower claim.

Shurtloff.—The compressor recently installed has started. This property is worked by a leasing company, and it is understood that the strike recently made on the 700-ft. level is holding out well.

W. S. Stratton's Properties.—There has been no change, and the properties are working along as before Mr. Stratton's death. Mr. Stratton's son, I. H. Stratton, who received only \$50,000 by his father's will, has decided to try to break the will, and has begun the necessary legal steps. What effect this will have on the working of the mines cannot be determined.

GEORGIA.

WILKES COUNTY.

(From Our Special Correspondent.)

Seminole.—This mine is worked by a company headed by Capt. W. Murdock Wiley, formerly of

Salisbury, N. C., now of the firm of Wiley, Mitchell & Co., of New York City. A smelter is in operation under the management of Carl Hendrich.

IDAHO.

OWYHEE COUNTY.

Poorman.—The long idle mill at Silver City is again in operation. The vein found 400 ft. beneath the old workings is believed to be the same as that from which so much rich gold and silver ore was once taken.

ILLINOIS.

Hoisting Engineers' Wages.—The scale of wages recently adopted at a convention of the Illinois Coal Operators' Association and the National Brotherhood of Coal Hoisting Engineers is: Class A mines—First engineer, \$80 per month; second engineer, \$70 per month; third engineer, \$65 per month. Class B—First engineer, \$75 per month; second and third engineers, \$65 per month. Class C—First engineer, \$75 per month; second engineer, \$62.50 per month. Class D—Each engineer, \$60 per month.

INDIANA.

VANDERBURG COUNTY.

(From Our Special Correspondent.)

National Pottery Company.—This Evansville company has incorporated with a capital stock of \$100,000. Work on the plant will begin at once, and the new industry will employ 200 men in the mines and 200 in the manufacturing plant.

KANSAS.

LEAVENWORTH COUNTY.

Coal Miners' Wages.—At a recent meeting with Mr. Snyder, of the Home-Riverside Company, and Edward Carroll, of the Carr Coal Company, the miners signed an agreement covering work at the mines near Leavenworth, under which the miners are to receive 84c. a ton, mine run, for digging coal, and are to be paid certain allowances for shale.

MICHIGAN.

COPPER—HOUGHTON COUNTY.

(From Our Special Correspondent.)

Champion.—Work on the new dam near E shaft has started. It will supply water to the boiler plant.

Franklin.—The new rock and shaft house at No. 5 shaft of the old branch of the mine is in commission. It replaces the building burned a month ago, and was removed from the north shaft of the Junior branch. Operations at the old mine are confined to Nos. 3 and 5 shaft. In the old stopes rock overlooked during former operations is being hoisted.

Trimountain.—S. A. Parnall has been appointed superintendent of this mine, vice Capt. James Chynoweth, resigned. John M. Wagner, formerly of the Centennial, has been appointed clerk and purchasing agent to succeed Alonzo Nicholas.

COPPER—KEWEENAW COUNTY.

(From Our Special Correspondent.)

Adventure.—This company's new stamp mill at Adventure Beach is in commission, with one head stamping rock. Shipments from Nos. 1 and 3 shafts and the stockpiles aggregate 450 tons of rock per day.

IRON—MARQUETTE RANGE.

Negaunee.—This mine at Negaunee now employs about 400 men. The workings are reported in better condition than for some years. The present operator is the United States Steel Corporation.

MINNESOTA.

(From Our Special Correspondent.)

All the 8 Marion steam shovels contracted for by the Minnesota Iron Company will be used at mines in this State. Some will be at open pit mines and at stock piles on the Mesabi and some are for the Vermillion.

It is expected that freight rates on iron ore will be higher next year than now, some vessel and ore men predicting an advance of about 10c. for season charters by the Pittsburg Steamship Company. The general idea is there will be a considerable increase of all kinds of freight, and that the season will be shorter than this year.

The Great Northern road will add 17 miles of double track to its ore line, giving a double track from the junction of its 2 ore roads to its docks, and will also build another ore dock. The road is continually exploring on the Mesabi, and is finding some ore, though its efforts are not rewarded with former success. The story that the road would build to the Vermillion Range is without foundation.

The James H. Hoyt took on a cargo of 5,202 tons of ore last week in 90 minutes, of which time 28 minutes were spent in shifting from chutes to chutes of the dock, so the time is practically 5,000 tons an hour.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

A considerable body of ore has recently been explored in Section 11, T. 58, R. 18, but is to be held for the future by its owners, who have confidence in the future of comparatively low-grade bodies of iron-bessemer ore.

Commodore.—It is rumored that this mine, near Virginia, will be re-opened. This is quite probable, as the date is approaching when actual tonnage mined will be no more than the stipulated minimums. Some new equipment is said to have been ordered.

Fayal.—This mine has increased shipments, is putting out about 10,000 tons a day, and will make its expected total for the year. The milling pit west of No. 2 shaft is to be enlarged under a very heavy stripping. A very large amount of lean siliceous ore has been handled this year from the pit at No. 3 shaft, some of which has been mixed and shipped, and some put aside for the future.

Penobscot.—This mine will not make the anticipated output, and probably not more than 250,000 tons will be produced this year.

Shenango.—At this mine of the Oliver-Snyder interest, operated under contract by the Minnesota Iron Company, a new shaft, midway between Nos. 1 and 2, is started. No. 1 is abandoned on account of quicksand, and No. 2 has had similar trouble. An order has just been placed with the Prescott Steam Pump Company, of Milwaukee, Wis., for a very large pump. The mine was expected to ship this year, but will not on account of vexatious delays encountered in opening it. It should ship at least 100,000 tons in 1903. There are some 7,000,000 tons of ore in this mine of very fine grade.

Stephens.—This mine is still under preliminary work. It will, perhaps, ship a cargo or two this year. Three engines are now employed stripping. The mine will be a big producer next year. All the work done is with the idea of great business later.

Wills.—This mine, now being opened by officials of the Republic Iron and Steel Company, is expected to ship about 10,000 tons this year, and will be prepared for a considerable movement next season. Tracks from the Duluth & Iron Range road are being laid. This is the 6th mine to ship from near McKinley, all being small properties except the Elba and Corsica.

IRON—VERMILION RANGE.

(From Our Special Correspondent.)

The McComber is said to have drilled one hole to the depth of not far from 500 ft.

Drills are going into the middle of T. 62, R. 11, northeast of Section 30, and several will start on the strike or the ore-bearing formation through that township.

A drill is at work northeast of the Savoy Mine, at Ely, in land belonging to J. Stram.

A drill is at work north of the Pioneer Mine, but so far without result.

Oliver Iron Mining Company.—This company has started 2 diamond drills in the land under option to it, just west of the McComber Mine.

MISSOURI.

CLAY COUNTY.

Coal Miners' Wages.—The wage scale recently agreed on is the same as last year and contains these provisions: Long wall mining, \$1 per ton; loading after pick machines, 60c. per ton, loader to be paid for cleaning up slate below machine if over 6 in. Day wages are: Sinkers, not less than \$2.40 per day, or 20c. per hour; mining machine men, \$2.25; track layers, \$2.25; pushers, trip riders, cagers, water bailers, drivers and all other classes of work underground, \$2.05; boys, \$1 to \$1.65; topmen, 20c. per hour.

JASPER COUNTY.

(From Our Special Correspondent.)

Joplin Ore Market.—Ore prices were strong last week throughout the district, and advances of from 50c. to \$1 were paid on medium grades, most of the advance being at Cartersville, Galena and Aurora as few Joplin lost advanced; \$35 is again about the assay basis. As a rule ore that assayed over 60 per cent sold on a basis of \$35 for 60 per cent ore, while on lower grade ores the price was equivalent to \$34 for 60 per cent ores. There was no decrease in the demand for lead, all of the buyers being anxious to get all they could without advancing the price, and a premium was paid for some exceptionally high-grade lead in various parts of the district.

During the corresponding week of last year the best grades of zinc ore sold at \$27 per ton, or \$11 less than last week, and lead sold for \$46.50. The zinc shipment was larger than by 499,130 lbs., the lead sales larger by 188,660 lbs., and the value less by \$23,206. For the corresponding 39 weeks or 9 calendar months of last year the zinc sales were less by 13,411,910 lbs., the lead sales greater by 3,444,880

lbs., and the value less by \$1,245,480. Following are the sales from the various camps of the Joplin District for the week ending September 27.

	Zinc, lbs.	Lead, lbs.	Value.
Joplin	2,585,310	371,520	\$61,700
Galena-Empire	1,008,780	252,000	21,379
Cartersville	1,060,110	271,890	34,053
Aurora	508,940	17,240	9,626
Duenweg	1,420,170	125,980	28,600
Oronogo	277,280	40,190	5,002
Prosperity	349,060	14,850	6,196
Zincite	121,630	291,190	2,783
Spurgeon	141,020	14,250	2,404
Central City	144,750	16,190	2,319
Neck-Alba	53,900	8,890	1,182
Granby	365,000	45,000	4,725
Carl Junction	253,160	.....	4,683
Peoria	5,770	20,410	548
Total	10,108,280	1,217,550	\$178,871
Total 9 months	403,597,310	48,533,670	\$7,128,824
Zinc value, week, \$149,386; lead, \$29,485; zinc value, 9 months, \$6,039,644; lead, \$1,189,180.			

Curtailling Zinc Shipments.—At a meeting of the ore producers held at the rooms of the Missouri-Kansas Zinc Miners' Association on September 23 the question of mining but 5 days a week was discussed, but the general sentiment seemed to be that the producers should wait for a well-defined slump in the market before trying to put the project into effect.

MONTANA.

BROADWATER COUNTY.

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

GRANITE COUNTY.

Lead King.—Charles Murray and Ed. Miller, lessees of this mine, one of Dr. Mussigbrod's properties at Garnet, recently shipped a full car-load of ore, which gave smelter returns of \$184 per ton. The mine has been developed to more than 500 ft., the ore being of good milling quality. The mine is temporarily closed on account of a breakdown in the machinery.

Shamrock.—Col. C. Parker has secured a lease on this mine, at Garnet, from Peter S. McDermott and the Lannen Brothers. Mr. Parker will sink another lift and also drift for the pay ore. A large force of men will be put to work.

MADISON COUNTY.

Galena.—This mine, at Sterling, about 2 miles from Norris, and owned by Peter V. Jackson, has been sold to Minneapolis men for a reported price of between \$50,000 and \$60,000, one-third in cash. The mine has only been worked by lessees and the ore is gold. All the production has been from shipments of smelting ore, and there is much concentrating ore on the dump. The new owners have purchased machinery and are preparing for extensive work. The mine is developed by an incline shaft, down 225 ft.

Kearsarge.—Six car-loads of ore from this mine, near Virginia City, were received at the Colorado Smelter recently. This property is owned largely by Senator Millard, of Nebraska. About 30 men are employed.

PARK COUNTY.

(From Our Special Correspondent.)

Bear Gulch Gold Mining Company.—The new 40-stamp mill, at Jardine, furnished by the Allis-Chalmers Company, is on its way to the property. The machinery weighs 250,000 lbs.

Cowles Mining Company.—Ten stamps have been dropping on Hidden Treasure ore during the summer. The mill will be enlarged next year. E. W. Cowles, of Cowles, is manager.

Milwaukee-Montana Gold Mining Company.—Manager McNally announces that this company at Contact, will build a 25-stamp mill the first thing in the spring.

Montana Coal and Coke Company.—One hundred new coke ovens are under construction at Horr, necessitated by a contract to furnish the smelter at East Helena with 100 tons of coke per day.

Scotch Bonnet.—At this Cook City property a rich strike of gold ore is reported in the face of the tunnel.

Standard Mining Company.—This company, operating at Contact, has its new 5-stamp mill busy. C. R. Murdock is manager.

POWELL COUNTY.

Cable.—This mine, in the Moose District, 18 miles from Anaconda, idle since 1889, has resumed work. It was closed because of threatened litigation. Super-

intendent Bacorn, formerly of Butte, is in charge, and he has about 30 men employed. The property was discovered in 1866 as a placer, but is a lode mine. J. C. Savery, whose brother-in-law was the original owner of the mine, is manager.

(From Our Special Correspondent.)

Work on the new electric power line at the head of Race Track Creek, is progressing rapidly, and the ditches will probably be completed this fall, but owing to the difficulty of securing the 26-in. pipe the work of laying that will be postponed until spring. No contract for furnishing the pipes has been let. John F. Cowan, of Butte, is superintending the work. The pole line to Butte will be 30 miles long, and will transmit about 3,000 h.p. with a voltage of 30,000. No contract for the material, consisting of pipe, water motors, electrical machinery, transmission line, etc., has been given.

Black Diamond Coal Company.—This company will open the recently discovered coal measures near Anaconda. The capital stock is \$200,000 in \$1 shares, held as follows: I. Rosenfield, 50,000 shares; John H. Wein, 25,000; J. W. Black, 25,000, the rest being divided equally between C. M. Cusick, W. Williams and W. White, all of Anaconda.

SILVER BOW COUNTY.

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

Gold Hill.—This mine, near Parrot, is under option to F. A. Heinze and associates of Butte. The consideration is said to be \$40,000.

NEVADA.

WHITE PINE COUNTY.

(From Our Special Correspondent.)

New York & Nevada Copper Company.—This company is building a concentrating and smelting plant near Fly on the site of the old Keystone silver mill. A surface tram 6 miles long is being surveyed to carry the ore from the Copper Flat Mine to the smelter. It is reported that charcoal is to be used for fuel, as the plant is 90 miles from a railroad. The ore assays 3 per cent copper.

NEW MEXICO.

BERNALLILO COUNTY.

(From Our Special Correspondent.)

M. S. Otero, of Albuquerque, has 2 large retorts ready for shipment to Jemez Springs, where they will be used in refining an extensive deposit of sulphur.

Rock Island Cement and Plaster Company.—This company, with a capital of \$250,000, has its principal place of business at Ancho.

DONNA ANA COUNTY.

Modoc Mining Company.—The mill, 14 miles from Las Cruces, in the Organ Mountains, is in operation. There has been much interest in the Hooper pneumatic dry concentrator, and the first run of the plant is reported highly successful. There are seven concentrating machines in the mill, which average about 10 tons each in capacity. The ore is taken to the mill from the mine by an aerial wire rope tramway. The mine has been idle for a long time, as it was necessary to haul the ore to Las Cruces to be treated, and the mine was finally purchased by the present company for \$15,000. The ore is a lead-silver, averaging 20 per cent lead and from 3 to 10 ozs. silver per ton. The old shaft is 250 ft. and the new one 90 ft. The ore body at one place is reported 95 ft. through at 90 ft. depth. The company has a well 428 ft. deep and in addition there is a spring about 300 yd. above the mill.

GRANT COUNTY.

Aberdeen Mining Company.—A good supply of water is now available. A trial shipment of concentrates has been made. A Lidgerwood hoist has been installed on the Bluebird Claim. About 40 men are busy on the property at Lordsburg.

Comanche.—This group of claims in the Burro Mountains has been purchased by Michigan men through P. T. McGrath, of Denver, Colo. It is stated the new owners will erect a 200-ton leaching plant and a 200-ton smelter. A railroad is also to be built from the Santa Fe or Southern Pacific to the property. The owners include J. S. Curry, T. J. Atchison and Charles Humphrey, Ironwood, Mich., and C. J. Laughren, Escanaba, Mich.

Allesandro Copper Company.—At a depth of 150 ft. a good vein of copper ore has been opened up in the property of this company. The vein is 18 in. wide and the ore shows values of 40 per cent copper.

LINCOLN COUNTY.

Boston Boy.—This White Oaks mine has been bonded by W. A. McIvers, of Nogal, and men put to work. The mine is just north of the Old Abe property.

SIERRA COUNTY.

Flying Dutchman.—This mine, situated near the Ready Pay group, has been purchased by R. H. Hopper.

Las Animas Gold Mining Company.—This company, reports say, is to be reorganized as the Hub Mining and Milling Company. Work will at once start at the Wicks Mine and a new mill will be erected. The stockholders are Boston parties.

SOCORRO COUNTY.

(From Our Special Correspondent.)

The new mining district in the Osuna Mountains has been named the Jones District, after Prof. F. A. Jones. An enormous quantity of hematite iron ore is reported in sight carrying 69 per cent iron.

NORTH CAROLINA.

CABARRUS COUNTY.

(From Our Special Correspondent.)

Nugget.—This gold mine and the adjoining property are worked by F. H. Mauney and associates of Gold Hill. Several pounds of nugget gold have been taken out recently.

MONTGOMERY COUNTY.

(From Our Special Correspondent.)

Iola.—This gold mine, near Troy, is down 140 ft. in decomposed quartzite. The 10-stamp mill has been in operation for 4 months, and has produced about \$15,000 in gold at a very small cost, as the ore is cheaply mined and free milling. Milton Jones, of Troy, is superintendent.

Russell.—This gold mine, on the Palmer lot, has opened an extension of the Reggon Hill vein, showing 10 to 15 ft. of high-grade ore. A 10-stamp mill is producing gold day and night at a profit.

ROWAN COUNTY.

(From Our Special Correspondent.)

Gold Hill.—The reports from this old copper mine are encouraging. Large bodies of ore with good values have been found, which years ago were abandoned on account of the copper contents. Walter Newman, president, has charge of work at the mine and mill.

Union.—Under the new management of R. McGillivray, the mill and mine are in steady operation, shipping several car-loads of concentrates per month to New York. It is reported that the property is now paying, and no doubt it will until a break down in the mill, as the plant has always caused trouble. In these slates, although a stamp mill makes some slimes, yet with concentrators it is generally the simplest and cheapest method of handling the ore.

Whitney Reduction Company.—This company has opened offices in Salisbury, 5 miles from which place it has a large granite quarry under the management of A. J. Wills, shipping several car-loads of granite daily. The McMackin gold mine operated in the Gold Hill District, has a 10-stamp mill and chlorination works. The mine is 600 ft. deep, and employs a number of men. From New London a 7-mile railroad is being built to connect all the company's enterprises with its great 20,000-h.p. plant on the Yadkin River. Col. E. B. C. Hambley, president of the company, is building a residence in Salisbury.

STANLY COUNTY.

(From Our Special Correspondent.)

Barringer.—This gold mine, near Gladston, is again worked under lease to J. Caroll Gough, of Cleveland, O., who is developing with a view to finding a rich shoot.

OREGON.

BAKER COUNTY.

(From Our Special Correspondent.)

Cornucopia Mines Company.—The 20-stamp mill is busy on ore from the Last Chance property. The vein now has 2 divisions, 12 and 14 ft. wide, respectively, and each is stoped and filled to support the dividing wall. The ore is high grade. The property of John E. Searles is in the hands of Receiver George W. Beatty.

Dixie Butte Mining and Mines Company.—J. H. Brown has promoted this company, with a capital of \$50,000, to erect a custom concentrating plant of 50 tons daily capacity and will consist of a 5-stamp mill and a Huntington mill with rolls, crushers, concentrators and jigs. Mine owners of the Quartzburg District have already contracted to furnish 1,500 tons of ore monthly. The Allis-Chalmers Company, of Chicago, Ill., will furnish machinery. A survey is completed for a ditch, 1 mile long, to furnish water power for operating the mill from Dixie Creek, near Corner.

North Pole.—Twenty more stamps, giving a total capacity of 30 stamps, and a cyaniding plant for treating crude ore, will be installed at the property near Sumpter. The company is also changing the cable of the 1¼-mile aerial tramway. No information is given of output in bullion from plates and returns from ore shipped direct to smelter. Alexander Baring, of London, owns the mine, and recently bought

2 fractions on the Mother Lode for a reported price of \$57,000.

Psyche.—The 20-stamp mill for this Sumpter property is on the ground and frame of building is partly up. Judge J. Fawcett, of Omaha, Neb., the owner, expects to have it treating ore within a month, when the cross-cut opening the vein 200 ft. below former workings will be completed.

South Pole.—Men are driving 2 tunnels on the Rock Creek side. The company is capitalized at \$3,000,000.

PENNSYLVANIA.

ANTHRACITE COAL.

Anthracite Miners' Striki.—Since the operators began increasing the output of washeries and collieries there has been a great increase in riotous acts throughout the coal fields. The situation for those miners who were opposed to the strike from the beginning consequently is worse than ever, yet Governor Stone has taken no really efficient measures to repress violence, arson and murder. It is a noteworthy fact that although John Mitchell publicly disclaims all rioting, yet after a recent visit of his to the upper fields, when he publicly told the miners not to violate the law, assaults on non-union men showed a sudden increase and necessitated the sheriff calling on the Governor for troops. As the troops called out were local militia companies, containing striking miners and strike sympathizers, they have not done much to check intimidation or secret violence, only dispersing mobs after the worst damage has been done. As the striking miners now have a very thorough system of pickets about all workings, and every man going to work is exposed to insult and knows that he or his family may be assaulted if unprotected, it can readily be seen why the production of coal has shown no material gain during the week. Governor Stone has signally failed to give those men who wish to work the protection of the law, and the question of mining coal is no longer between the operators and the miners; it is between the Governor and the State constitution.

Production is about 29,000 tons daily, most of it washery coal.

BITUMINOUS COAL.

Helvetia.—An explosion of gas in this mine of the Rochester & Pittsburg Company, near Stanley, last week injured 7 men, 1 fatally.

Keystone Coal and Coke Company.—This company purchased recently 310 acres of valuable coal land a half mile west of Greensburg, from J. B. Keaggy, of Allegheny. The consideration was \$90,000.

Leckrone Fuel and Coke Company.—This company has opened a mine in the lower Connellsville Region in what is said to be the shortest time on record. The mine was opened in 3 weeks from when the first pick was struck in opening the pit. Coke will soon be coming from 32 ovens, which have been built since work began.

SOUTH DAKOTA.

CUSTER COUNTY.

(From Our Special Correspondent.)

Clara Belle Mining Company.—The annual meeting at Custer resulted in the election of Frank Hebert, president and secretary; F. A. Gira, vice-president; Charles Hebert, treasurer; A. Wilcox, director; all of Custer. The 2-stamp Tremaine mill is running on ore from the new shaft.

Le Roy Mining Company.—S. E. Ainslie, superintendent, is to continue development.

LAWRENCE COUNTY.

(From Our Special Correspondent.)

Aksarben Mining Company.—O. L. Benway, of Rock Island, Ill., is president; J. W. Good, of Chadron, Neb., vice-president, and A. D. Benway, of Lincoln, Neb., secretary and treasurer. Title has been acquired to 32 acres in Sheeptail Gulch and 60 acres on Annie Creek. The cyanide plant of the Detroit & Deadwood Company on Annie Creek has been leased and will be started on ore from the Annie Creek property as soon as repaired.

Cleopatra Mining Company.—Sinking continues in the Squaw Creek shaft. The cyanide plant will start in October on ore from the upper ore horizon. Camele Rock, of Lead, is in charge.

Gladiator Consolidated Mining Company.—Frank Murphy has sold to this company the Tip Top group of claims, embracing 40 acres, on the extension of the vein. The manager, C. H. Crabtree, of Des Moines, Ia., has awarded a contract to James Blaine to cut 200,000 ft. of lumber and timbers, for building shaft-house, boarding house, etc.

Ontario-Wanda.—R. A. Murray has taken a lease and is preparing to ship ore carrying lead and silver. The workings are being cleared of caved earth, and the vein exposed. Shipments will be to the National Smelter of the Horseshoe Mining Company, at Rapid City.

PENNINGTON COUNTY.

(From Our Special Correspondent.)

National Smelter.—The Elkhorn Railroad is building a spur to the slag yard. The granulated slag will be used for ballast.

Rapid River Placers.—Three companies have been working the creek bed near Silver City and Pactola, the Big Bend Placer Company, Maggie Placer Mining Company and the Rapid River Mining and Extraction Company. Final clean-ups are being made preparatory to closing for the winter. The companies have made a fair profit.

TENNESSEE.

CUMBERLAND COUNTY.

Lantana Coal-fields.—Capt. J. N. Baker, manager of the Cumberland Coal and Coke Company and a number of Rockwood men have begun to develop these coal-fields. They have leased a 5,000-acre tract of coal land from the Citizens' Co-operative Coal Land Company, of Crossville, for 30 years, and have paid \$3,000 down. Some time ago the Nashville, Cincinnati & St. Louis agreed to build a branch line to these mines if sufficient tonnage could be assured.

TEXAS.

CHAMBERS COUNTY.

(From Our Special Correspondent.)

Corsicana Oil Field.—The August report is as follows: Wells completed, 3; dry holes, 3; abandoned, 6; drilling, 2. Totals to August 31: Completed, 1,102; producing, 584; gas, 22; dry, 241; abandoned, 255.

Higgins Standard Oil Company.—This company's well, at Barber's Hill, is down between 900 and 1,000 ft., and will probably be abandoned, as the casing has been twisted off. Results failed to justify the promoters' prospectus.

GALVESTON COUNTY.

(From Our Special Correspondent.)

Atlantic & Pacific Company.—This company's well, on Galveston Island, has been abandoned at a depth of 1,500 ft., and the casing will be pulled if possible. Nothing of any value was found.

JEFFERSON COUNTY.

(From Our Special Correspondent.)

Beaumont Oil Field.—The Lone Star Crescent Company and the Higgins Oil and Fuel Company have each brought in a new well. They will be promptly equipped.

The evidence given before the Railway Commission at Austin showed that the railways practically required all their tank cars for their own use, and in addition were confiscating private cars. It was stated that from 500 to 750 bbls. per day was the capacity of the wells, also that 75 per cent of the production went to storage and for water shipment, and it is evident from the car reports that more than half the rail shipments went to fill railway needs.

Port Arthur.—The test well to determine if there is any oil near Port Arthur has started.

UTAH.

(From Our Special Correspondent.)

Ore and Bullion Settlements.—The Salt Lake banks report the following settlements for the week ending September 27: Gold-silver lead and copper ores, \$226,800; American Smelting and Refining Company bullion, \$183,300; gold bars, \$8,300. Total, \$418,400.

BEAVER COUNTY.

(From Our Special Correspondent.)

Horn Silver.—This company shipped from Frisco to the samplers 5 cars of ore for the week closing September 27.

King Bird Consolidated.—Superintendent J. B. Lickleder has gone to Salt Lake with samples of rock carrying ruby silver, lead and copper. This property is located in Beaver Lake District, not far from Milford, north of the O. K. Mine.

Majestic.—It is stated that native copper is appearing on the 400 level of the O. K. The boarding and bunk houses and office building for the smelter are completed. The stone foundation for the smelter will be 12 ft. high and the rest of the building of iron and steel. Lime for the masonry is being burned by S. Boyter in the Granite Range. Ten men are at work in the brick kilns, about a mile above the smelter site.

BOX ELDER COUNTY.

(From Our Special Correspondent.)

Century.—This company has sent down a car of concentrates from its mill, at Park Valley, to be sampled by the Taylor & Brunton Company. The mill is reported to have another shipment nearly ready.

JUAB COUNTY.

(From Our Special Correspondent.)

Tintic Shipments.—In the week closing September 27 the Mammoth shipped 9 cars ore; Gemini, 6 cars ore; Eureka Hill, 18 cars ore; Grand Central, 20

cars ore; Eagle and Blue Bell, 6 cars ore; Bullion-Beck, 7 cars ore; South Swensea, 1 car ore; Ajax, 1 car ore; Alaska, 1 car ore; Carisa, 1 car ore; Centennial Eureka, 17 cars ore; Dragon iron, 18 cars ore; Yankee Consolidated, 6 cars ore; Lower Mammoth, 2 cars ore.

La Raine.—This property has suspended operations, and has called for an assessment. The property is on Godiva Mountain.

Pioneer Group.—It is reported that this ground, which has been prospected to a depth of 300 ft. by a Scotch company under the management of W. D. Sheppard, has got ore assaying \$15 per ton in gold. The vein, so far as prospected, is about 20 ft. thick. Mr. Sheppard goes East to make plans for erecting a mill and cyaniding plant.

Uncle Sam.—The use of the Tesora Mill has been secured, and milling will begin at an early date.

PIUTE COUNTY.

(From Our Special Correspondent.)

Annie Laurie.—The option on the mine, stated at \$5,000,000, has been called off, and the mine is said to be no longer for sale. The management secured the annulment of the option before the news of new strike leaked out.

SALT LAKE COUNTY.

(From Our Special Correspondent.)

Bingham Shipments.—The Petro, United Bingham, Bully Boy and Mountain Gem each report a car-load of ore, and the Niagara 4 cars for the week ending September 27.

Ben Butler.—September shipments were about 500 tons of crude ore and concentrates, and earnings somewhere near \$8,000.

Bingham Consolidated.—The smelter shipped 3 cars of copper bullion, 180,000 lbs., in the week ending September 27.

Oxford & Geneva Company.—This company shipped a car of ore in the week ending September 27 from Alta.

Utah Consolidated.—The Highland Boy Smelter shipped East 4 cars of copper bullion, aggregating 240,000 lbs., in the week ending September 27.

SUMMIT COUNTY.

J. I. C.—A steam hoise to be set up at the shaft at Park City is on the ground. The shaft is down 70 ft. G. D. B. Turner is manager.

(From Our Special Correspondent.)

Park City Shipments.—The output for the week ending September 27, as reported by the Mackintosh Sampler, is as follows: Daly West, 2,847,800 lbs. ore; Anchor, 437,700 lbs. ore; Ontario, 938,970 lbs. ore; Loring lease of Silver King, 149,460 lbs. ore; Silver King, 1,385,492 lbs. ore.

Crook.—This property has quietly passed into the hands of a company headed by Jno. Dern, of the Consolidated Mercur by the purchase of shares in the open market and at private sale. The new directors are: Jno. Dern, president; Lewis B. Larsen, of Fremont, Neb., vice-president; W. B. Andrew, of Salt Lake, secretary and treasurer.

Daly-Judge.—Prospecting on the North Anchor vein shows a streak of 18 in. of carbonate of lead with chloride of silver.

Mackintosh Sampler.—Superintendent J. B. Fleming is reported as saying the next 30 days ought to see the completion of work on the remodeled plant. The new equipment for treating zinc ores is being adjusted.

TOOELE COUNTY.

(From Our Special Correspondent.)

Stockton Shipments.—The Galena King shipped 1 car of ore and the Ophir Hill 10 cars of concentrates from Ophir for the week ending September 27.

Black Diamond.—Manager Joe Dederichs reports a strike of lead ore on the 180-ft. level, with the usual values in silver and gold.

Galena King.—The Wisconsin men who lately, through Capt. McVichie, secured this property for something near \$100,000, have elected as directors Col. J. H. Knight and Judge H. Cochrane, of Ashland, Wis.; C. S. Ray, H. A. McCornick and D. McVichie, of Salt Lake. The board will early in October elect officers.

Honoring.—Manager Snyder, with others, has been over the ground of the big tunnel, and decided to go ahead with the scheme.

Sunshine.—This mine, near Mercur, has shipped about \$5,000 of gold dust from its mill. Superintendent David Kelly reports the workings underground to be maintaining a fine average. About 200 tons are treated daily. Several changes will be made by Manager George Moore in the machinery.

Utah.—This mine, at Fish Springs, has shipped a car of ore.

WASHINGTON.

FERRY COUNTY.

(From Our Special Correspondent.)

Black Tail.—One hundred tons of ore from above the intermediate level are to be shipped to the Granby Smelter at Grand Forks, B. C.

California.—There are now 65 men employed. A new strike of rich ore has been made between the 3d and 4th levels. Ore shipments continue to the Hall Smelter, at Nelson, B. C. A car-load of 32 tons has netted \$1,850 above the treatment and railroad transportation charges.

Flagstaff.—Work has been resumed in a tunnel with 5 men busy.

Morning Glory.—Three men are employed prospecting on the bottom level.

Republic Gold Placers.—The purchasers of the Little Ruby claim have secured options on the adjoining claims.

San Poil.—Returns from the Granby Smelter from 100 tons of ore show a net profit over mining, transportation and treatment of \$8.80 per ton, as follows: Assay value, \$17.80; 5 per cent deducted at smelter, 89c., freight and treatment, \$6.50; cost of stoping and handling (approximated), \$1.61. The management figures 500 tons of ore on the dumps and 300 tons broken in the mine. The estimated reserves of ore in the mine are 22,000 tons. A winze is down 70 ft. below the floor of the No. 2 tunnel level in good shipping ore. The company is out of debt and has money in the treasury.

Silver Dollar.—A diamond drill will be put in at the 200-ft. station to prospect for the north extension of the Trade Dollar vein.

Tom Thumb.—This Republic mine has shipped 60 tons of ore to the Granby Smelter.

Trade Dollar.—The north drift on the 300-ft. level is in 80 ft., and the quartz, of good shipping value, is 7 ft. wide. The south drift, in 75 ft., shows good ore 4 ft. wide.

Zala Consolidated.—F. W. Rolt, secretary, has been at Republic from the main office in Rossland, B. C. The superintendent reports 18 men stoping ore on the 100, 150, 200 and 300-ft. levels, most of it coming from the 300-ft. Shipping is temporarily suspended.

OKANOGAN COUNTY.

(From Our Special Correspondent.)

The town of Chesaw is 4 miles south of the international boundary, 20 miles east of the Okanogan River, and is 14 miles west and 36 miles north of Republic. By wagon road the distance from Republic is 43 miles. The mean elevation of the town is 2,970 ft. The highest elevation in the mining section is Copper Mountain, 6,300 ft., on top of which is the Buckhorn Mine.

Beaver Lake.—A 300-ft. tunnel has struck the ledge 300 ft. deep. The vein is 30 ft. wide. Assays are mostly in copper, with some gold and iron from \$11 to \$19 per ton, the relative values being \$5 in copper to \$2 gold.

Bodie.—A rich strike is reported in this mine, at Bodie. Between 200 and 300 tons are on the dump of No. 2 tunnel, and 6 men are employed. The ore must be shot down to the wagon road, about 400 ft. below, for which a slide must be constructed.

Grant Group.—W. T. Mendenhall, representing Minnesota and Connecticut capital, is now in Minneapolis. He has 4 men busy at the mine, near Chesaw. A shaft is being sunk 100 ft.

Little Beaver Placer.—This claim is on Little Beaver Creek, 4 miles northeast of Mount Bonaparte. Four men are ground sluicing to get to bedrock. It is in 100 ft. of flume.

Rainbow.—This Chesaw property was lately sold for \$5,000 to Spokane people.

STEVENS COUNTY.

(From Our Special Correspondent.)

Old Dominion.—This mine has been idle 8 years. It had produced largely from the surface and was regarded as a most valuable property. It was backed by Peck Brothers, of Chicago, Ill., and worked under the direction of the late Clarence King. A tunnel, driven about 3,000 ft., never reached the vein, due to the failure of its backers. The mine was opened to 800 ft. and is reported to have 1,100 ft. of underground workings. The plant consists of a crushing mill, concentrators, compressor and power drills. The concentrates were hauled by wagon over 100 miles to Spokane, Wash., and are said to have paid a handsome profit. It is said that the tunnel was driven on account of the ore giving out in the shaft workings. Work has been resumed under the backing of Minneapolis, Minn., men.

WYOMING.

CROOK COUNTY.

(From Our Special Correspondent.)

Moorcroft Oil Fields.—Four new rigs have started drilling for oil within a few miles of Moorcroft

Station on the Burlington Railroad. Several other companies in the field will have rigs on the ground in a short time.

SHERIDAN COUNTY.

(From Our Special Correspondent.)

Sheridan Coal Mine.—This property, at Dietz, under the management of Stewart Kennedy, has developed into a very important industrial enterprise, and is producing 2,000 tons of coal daily. This coal is shipped East as far as Omaha, and as far west as Butte. The Burlington Railroad is using a large daily tonnage on its locomotives.

FOREIGN MINING NEWS.

AUSTRALIA.

NEW SOUTH WALES.

Broken Hill Proprietary Company.—This company reports that in the four weeks ending September 10 the output of its refinery was 422,499 oz. silver, 4,887 tons lead and 38 tons hard (antimonial) lead.

CANADA.

BRITISH COLUMBIA—ROSSLAND DISTRICT.

Rosland Ore Shipments.—Shipments from the camp for the week ending September 20 and for the year to date, according to the *Rosland Miner*, are as follows:

	Week.	Year.
Le Roi.....	4,260	164,881
Le Roi No. 2.....	1,204	47,755
Centre Star.....	1,200	10,432
War Eagle.....	750	4,298
Rosland Great Western.....	..	2,400
Glant.....	200	2,145
Cascade.....	..	300
Columbia-Kootenay.....	..	30
Bonanza.....	..	90
Velvet.....	60	670
Splitzee.....	..	20
White Bear.....	..	5
Totals.....	7,074	233,024

BRITISH COLUMBIA—SLOCAN DISTRICT.

Slocan Ore Shipments.—The total amount of ore shipped from the Slocan and Slocan City mining divisions for the year 1901 was approximately 30,000 tons. Since January 1 to September 20, 1902, the shipments have been as follows, according to the *New Denver Ledger*:

	Week.	Total.
Payne.....	82	1,072
Ivanhoe.....	20	372
Sunset.....	..	764
Reco.....	..	322
American Boy.....	21	737
Arlington.....	..	2,789
Hewett.....	..	765
Bosun.....	40	850
Last Chance.....	..	168
Wonderful.....	..	151
Enterprise.....	..	1,740
Lavina.....	..	85
Bismarek.....	..	62
Queen Bess.....	..	160
Silver Glance.....	..	77
Whitewater.....	44	2,881
Ottawa.....	..	8
Capella.....	..	40
Florence.....	..	1
Trade Dollar.....	..	20
Slocan Boy.....	..	115
Neepawa.....	..	101
Hartney.....	..	25
Marion.....	..	80
May.....	..	7
Paystreak.....	..	5
Suprise.....	..	22
Monitor.....	..	870
Slocan Star.....	..	553
Duplex.....	..	7
Emily Edith.....	..	20
Wakefield.....	..	180
Prescott.....	..	4
Rambler.....	86	3,695
Molly Gibson.....	..	1,500
Washington.....	..	187
Follott.....	..	2
C. O. D.....	..	2
London Hill.....	..	115
Ruth.....	42	588
Antoine.....	..	20
R. E. Lee.....	20	80
Spectator.....	..	4
Red Fox.....	20	40
Antoine.....	..	40
Hampton.....	..	4
Mercury.....	21	21
Total tons.....	396	21,331

ONTARIO—LAKE OF THE WOODS DISTRICT.

(From Our Special Correspondent.)

A large amount of development work is now going on in this district, especially at the Combine and Golden Horn mines. The latter, under the management of Mr. Rideaut, is making excellent progress, and has rich ore on the dump and blocked out.

Eagle Lake.—A large amount of prospecting and development work is now under way, and much interest is taken in the rich finds.

Flint Lake.—The Krupp ball mill is installed by Theo. Bridenbach, and development is progressing.

Foley.—Preliminary work is being done at this mine, at Mine Center. The machinery has not been used for 3 years. The pipe line is being repaired, and

the compressor and tramway are in order. A cross-cut has been run at the 200-ft. level towards the Lucky Joe vein.

Gold Reef.—At this mine, 2 shafts are being sunk under contract by Charles Shields.

Grace.—The miners have struck the vein in the tunnel, near Eagle Lake, and found ore as rich as on the surface.

Northern Light.—Newton Higbee's company is working the Eldorado property, and C. E. Brent is making a run of ore through the little test mill.

MEXICO.

SONORA.

Mexican Coal and Coke Company.—This company, incorporated a few years ago under the laws of New Jersey with a capital stock of \$5,000,000, owns about 30,000 acres of coal lands, situated in the Barroteran and Hondo districts. The mines now worked are at Esperanza. More than 2,000 men are reported on the pay roll there, and the daily output of coal aggregates 2,000 tons. The daily output of the coke ovens is from 200 to 300 tons.

NEW ZEALAND.

(From Our Special Correspondent.)

Hauraki Gold-field.—The chief returns during July were: Waibi, £38,061 (\$190,315), from 14,491 tons; New Zealand Crown, £5,044 (\$25,220), from 3,029 tons; Tairua Broken Hills, £2,420 (\$12,100), from 500 tons; Komata Reefs, £2,230 (\$11,150), from 1,080 tons; Kauri Freeholds, £1,220 (\$6,100), from 1,228 tons; Waitekauri, £3,805 (\$19,025), from 3,118 tons.

On account of the unprofitable nature of the ore now being worked, the Waitekauri Company has closed its battery indefinitely, and the return noted above is for the present a final one. In the meantime development is to continue. During the 8 or 9 years of its existence this company has obtained gold to the value of £363,580 (\$1,817,900) from approximately 140,000 to 150,000 tons of ore. In the lower levels the gold-bearing quartz of the upper levels has been almost entirely replaced by worthless calcite. The writer believes that quartz with probably more or less gold will be found on sinking to a sufficient depth, and very rich stone may be met in the deeper levels at the junction of the oxidized and original sulphide zones. During the last 2 years the Waitekauri Company, instead of sinking, has driven prospecting levels in a vain endeavor to locate payable ore, meanwhile working out the reserves.

Hydraulic sluicing.—The published returns show that sluicing operations are being carried on in many parts of the South Island with marked success. Not only is old ground being worked over again with profit, but in many places new ground is being opened with very encouraging results. The heavy rainfall lately on the West Coast, although it has hampered dredging to some extent, has been of great benefit to sluicing claims.

West Coast Quartz Mines.—The Progress Mines maintain their usual good returns, the latest being £12,720 (\$63,600) from 6,540 tons. It is stated that a very rich reef has been discovered in the Croesus Claim, on the Paparao Range. The discovery is expected to lead to further developments of some importance.

SOUTH AMERICA.

CHILE.

Santiago vs. Liverpool.—The long legal contest between these 2 nitrate companies over a strip of valuable ground, about 20 acres in extent, has been decided by the Chilean courts in favor of the Santiago Company. An embargo is said to have been placed on the oficina Ramirez, owned by the Liverpool Company, for £30,000 (\$150,000), which is alleged to be the profit extracted from the Santiago land.

MINING STOCKS.

(Complete quotations will be found on pages 471 and 472.)

New York.

Oct. 2.

The sudden and unexpected relief in the money market by the action of the Secretary of the Treasury on Tuesday of this week has revived speculation. In the flurry Amalgamated Copper advanced from \$63½ to \$66½, but the number of shares sold has not been large. Anaconda was unattractive, selling at 102@104½ per cent (\$25.50@26.03). The curb coppers are languid. A few sales of United of Montana have been made at \$30@31½; Greene Consolidated, of Mexico, at \$27¼@28¾; Tennessee, \$17; White Knob, of Idaho, \$18@17½; Union, of North Carolina, \$3@2¾; British Columbia, \$5½@5½, and of Montreal & Boston at \$2¼@2½. More was done in Bamberger-De Lamar Gold, of Nevada, at \$10½@11.

Ontario Silver, of Utah, is weaker at \$8¾. A sale of Quicksilver, preferred, of California, has been made at \$8½.

Colorado stocks are about featureless, and sell at about last week's range.

Moulton, of Montana, has reappeared after a long absence, selling at 30c.

Comstock stocks are again feverish and lower. Consolidated California & Virginia sold at \$1.10, and Ophir at 95c.

Auction sales were: One hundred shares Bay State Seam-Face Granite Company, at 50c. a share, and 200 shares Playa de Oro Mining Company, of Ecuador, at \$2¼ per share.

Boston.

Sept. 30.

(From Our Special Correspondent.)

There has been a further weakening of copper shares the past week, due to general rather than local causes. Money has been firm at this center, but yet there has been no pinch. Naturally speculation has been restricted from this cause, although this market acts in sympathy with New York to a degree. With the bad break Monday copper shares stood the shock admirably. Copper Range Consolidated dropped \$2.75 to \$54.50, but recovered to \$57 again Tuesday. The strength of Amalgamated Copper shares has stood out in the face of a weak and nervous market. With all the favorable news from Montana of late it is felt that this and coppers in general would have scored material advances had not surrounding conditions been against it.

Clashing Montreal and Toronto interests in Dominion Iron and Steel have been reflected in the price of the shares, which have had a \$12 break to \$60 on very large dealings. The recovery from this to \$65.50 was sharp, however. President Ross, who has been in this city, uttered some rather pessimistic remarks relative to the value of the stock, which gave the traders an invitation to raid the stock. The Toronto end represents a good-sized pool in the stock, and the Montreal end has been talking bearish for some time.

Another noteworthy fact is the strength displayed in the Utah group of mines listed here—United States, Bingham and Utah Consolidated. These mines are all reckoned as money earners even with copper at 12 cents. The demand for United States is noteworthy, and although the stock declined a fraction to \$20.75, it recovered to \$21.50 on small dealings. Bingham holds around \$30, and Utah around \$21. Bingham will start its fourth furnace in a short time. Three furnaces are handling 500 tons of ore per day.

Old Dominion spurted \$1.50 to \$18, while other shares were heavy. Tamarack yielded \$7 to \$165 in the grand hurrah, and Calumet & Hecla \$10 to \$540. Centennial sold off \$1.50 to \$15.50, recovering to \$16.25. It is now expected that the erection of a mill will be deferred, although the company owns a mill site. Arrangements may be made to utilize two heads at the Arcadian's mill. Mass fell \$1 to \$1 on liquidating orders. United States Coal and Oil fell to \$14, in sympathy with the general weakness. The latter will soon issue a statement showing about \$900,000 cash on hand. Adventure receded \$1 to \$19.25 on selling, caused by the calling of an assessment. Atlantic dropped \$4 to \$25, due to the issue soon of the extra share capital. Dominion Coal has lost \$9 to \$126 on very light trading. Mohawk has fluctuated from \$46.50 to \$45, and has been fairly active.

Colorado Springs.

Sept. 26.

(From Our Special Correspondent.)

The will of the late W. S. Stratton was the subject of universal discussion almost to the exclusion of everything else in mining circles the past week. This important document was filed for probate last Saturday, and since its provisions have been made known, has had a marked effect on the market. The will provides that the vast estate of the multi-millionaire, valued at \$15,000,000, is to be disposed of as soon as possible, and as the mining interests represent \$10,000,000 worth of Cripple Creek property, the prospect of this amount of equity coming upon the market had a tendency to depress things generally; consequently mining stocks were very weak Monday, but rallied on Tuesday. The bulge was only temporary, and since that date prices have been shading off gradually until the low point was reached all along the line to-day. The declines have been almost entirely sympathetic in nature, as there is not the slightest possibility of any portion of the estate coming on the market for months, as a contest has already been commenced by the son to set aside the will of the millionaire, which means that several years of lawing will ensue before any disposition of the estate can be ordered by the court.

The death of Mr. Stratton and the filing of the will have, justly or unjustly, had the effect of bringing to a sudden end the boom of two weeks ago. As was advised in my letter at that time, the advance did not look healthy, and the prediction that it was largely a brokers' boom has been verified.

It is rumored in local mining circles that the Portland dividend, which falls due on the 5th of next month, is a matter of grave conjecture. Last Saturday Portland sold at \$1.95, but gained to \$2.01 the following Tuesday, since which time it has gone off, selling at \$1.97½@1.95 to-day, with but \$1.92½ bid and \$1.97 asked. Good reports continue to come in from the El Paso, which sold from 69 to 70c. all

during the week. Elkton sold from 37 to 38½c. during the week, closing to-day at 37@37½c. Gold Dollar Consolidated was quite an active trader during the week at 4¼@4½c. It is reliably reported that a good portion of the stock that came out was treasury stock, as the company is wiping out an indebtedness of about \$15,000. Gould sold from 7¼ on September 20 to 8¼c. on the 23d, selling at 7½c. to-day. The spurt was caused by a strike of some importance on the Nil Desperandum claim of the company. Isabella sold from 36 on the 20th down to 34½c. on the 24th, recovering to 35½c. on the same day and closing at 35c. to-day.

Salt Lake City.

Sept. 27.

(From Our Special Correspondent.)

A fairly steady market is the record shown by the week's tables. Most of the stocks held their own within the limits, high and low, of last week, but some could not stand the strain and dropped a few points. On the other hand, it can be called featureless unless the demand for Creole stock be named. This stock climbed to 67½@40c. at the opening on Monday, and during the week remained within these limits.

Daly, Daly West and Daly-Judge all scored some lower points than last week. Daly sold 1,800 shares at \$1.92@1.88; Daly-Judge 1,535 at \$11.90@11.60, and Daly West 300 at \$50.50@50.10. Consolidated Mercur stands at \$2.05@2, with sales of 8,275 shares. Grand Central fell a little, selling 550 shares at \$5.75@5.60. May Day placed 16,000 shares at 23¼@22¾c., and Lower Mammoth sold 8,700 at \$1.46@1.28. California led the list in shares, bringing out 66,400 at 46@41c., which is a point ahead of last week. The Exchange closes for the week, with sales of 461,387 shares, with a value of \$250,817.

San Francisco.

Sept. 27.

(From Our Special Correspondent.)

Business has been quiet, with rather a lower range of prices. The only incident was a little spurt in Potosi, which carried up the price to 22c. Other stocks were distinctly dull.

Some quotations noted are: Consolidated California & Virginia, \$1.15; Ophir, \$1.10; Caledonia, 95c.; Silver Hill, 53c.; Mexican, 31c.; Potosi, 19@22c.; Gould & Curry, 9c.; Sierra Nevada, 8c.

Business has been quiet on the Oil Exchange and only a few shares were dealt in. Prices, however, were fairly maintained. San Joaquin Oil & Development sold at \$7.25; Sterling, \$1.75; Apollo, 21c.; Monarch, 17c.

The Producers' Oil Exchange has decided to reorganize in order to broaden its field. It is the intention to deal in all securities except mining stocks. There are many unlisted industrial enterprises which will be listed and this is generally recognized as a long felt want on the part of the stockholders of these corporations. At present the market value of such securities is an unknown quantity, but under the proposed system of the Exchange the bid and asked price of all these securities daily quoted will establish market values. There will be no charge for listing and any corporation may list its stock, provided its application is approved by the listing committee of the Exchange. It is expected to put the new system in active operation by October 1, although the arrangement of preliminaries may possibly delay it beyond that date.

COAL TRADE REVIEW.

New York.

Oct. 3.

ANTHRACITE.

Whatever may result from the meeting between the presidents of several coal roads and several leaders of the United Mine Workers at Washington to-day, and whatever may be thought of President Roosevelt's policy in bringing about this meeting, the fact remains that had the Governor of Pennsylvania done his plain duty and given the protection guaranteed by law to every miner who wanted to work, and to that miner's family as well, there would have been no need for any conference, for the strike would have been ended before this and the public would have not suffered as it has for a month past from a lack of anthracite. Governor Stone has conspicuously failed to do his duty. Outrageous acts, including something like 23 murders, have terrorized men whose only offense was a willingness to work at satisfactory wages, and the present condition of affairs in some parts of the anthracite region is fairly comparable to what existed in the Coeur d'Alene country in Idaho before United States troops restored the reign of law and order. Under such conditions it is not strange that the output of collieries and washeries has shown but little increase during the week. As showing how some of the men now out feel about the strike, it is reported that one local at a recent meeting implored the union president of the district for permission to return to work, and when the president refused the 37 members present nearly mobbed him. Yet fear of the power of the union, more potent than the law of the State, as now administered, keeps these men idle.

Public sentiment has reached such a stage that it

regards the rights of the operators or of the miners of less importance than a supply of fuel. Some sections of the country are experiencing the most acute shortage of coal supply ever known. This is particularly true of the States north of Virginia and east of Ohio. In the sections of the West where anthracite is more or less of a luxury people are burning soft coal and finding much less trouble in getting it than the dwellers along the Atlantic seaboard. Along the Lakes, as well, bituminous is more plentiful than to the eastward, and hence the anthracite shortage causes inconvenience rather than distress. At the head of the Lakes anthracite is out of the market, with little prospect of any large supplies arriving before the close of navigation.

Retail prices in St. Paul are \$12 per ton and over for what little is left in dealers' yards. Of soft coal enough can be secured to keep people warm. In Chicago territory anthracite prices have risen to a figure that virtually has cut off sales, even though the tonnage available is small and is doled out in small lots. Bituminous coal of many grades is being burned, though the shortage of anthracite has cleaned the market of the desirable grades of smokeless coal. Along the Great Lakes and in Canadian territory little anthracite is to be had except at a few cities, and prices of soft coal have advanced, though nothing like as much as along the seaboard. In many Canadian cities wood is being burned in larger amounts than in many years, though at some points, as Montreal, bituminous coal is in good supply. Along the Atlantic seaboard, particularly at points north of Chesapeake Bay, disagreeable weather, an unexpected shortage in bituminous coal, with the market pretty bare of anthracite, brought about a condition of affairs that will be remembered for years. We note the following retail prices at various points: Chicago, \$14; Syracuse, \$14; Springfield, Mass., \$15; Boston, \$15@18; Portland, \$15; Hartford, \$13; New York, \$15@20; Philadelphia, \$15@20; Richmond, \$10.

BITUMINOUS.

The stringency in the Atlantic seaboard soft coal market that developed so suddenly last week still continues, but there is a chance that relief may be in sight. The leaders in the coal trade are bringing every influence to bear on the Pennsylvania Railroad, and putting the onus of the present situation squarely on President Cassatt. Remarks are heard disparaging the Pennsylvania's policy in seeking general freight, and, for instance, trying to get grain traffic away from the New York Central at a time when the directors of the Pennsylvania's policy must have known that the public needed or would need soft coal to make up for the shortage in anthracite, not to mention the fact that there was every reason to believe that the car supply would have to be better than last year to supply the regular demand for anthracite, strike or no strike. Now, after the situation has become acute, after thousands of people have suffered from the scanty arrivals of coal at tidewater, and \$8.50 per ton has been asked and paid for Clearfield grades, f. o. b. New York Harbor shipping ports, the railroads are making some efforts toward a better and more regular car supply. Producers, however, from hard experience have lost all confidence in any statements sent out by the railroads that car supply will be maintained or in the estimates of cars needed. The estimates made by the powers in charge of car supply last week were lamentably bad. A feeling has developed, rightly or wrongly, among the most conservative men in the trade that the railroads can meet the situation if they will. It is alleged that one reason why the railroads will not furnish more coal cars or more locomotives to move them is that soft coal pays the lowest freight of all merchandise, and wishing to make as good a show of earnings as possible the railroad presidents go after freight that pays better, and the public suffers. There are also ugly rumors circulated of favoritism in car supply and discrimination for certain interests. Thus, it is alleged, one railroad had a large number of cars building by a certain car company, and a large producer along the line of that railroad had a large number of cars ordered from the same works. When the cars for the railroad were finished they were turned over by the railroad to the producer, who put his company's name on them and is now using them. As coal is now selling at an advance of \$6 a ton, and the producers' tonnage is normally a heavy one, it is easy to see what profit may here arise from a mutual understanding and a little forethought. Again, it is alleged that another railroad has refused to put in switches or furnish cars to individuals owning coal lands along its lines, saying that it already has all the coal traffic it could handle—a good excuse, apparently, but one that may be questioned in the light of the present situation. It is also alleged that individuals owning coal lands along this line have virtually been obliged to sell their holdings to persons interested in the railroad. These allegations, and others that are heard, may be untrue, but they reflect the opinions of men not given to saying silly things.

All producers now are endeavoring to take care of the most urgent demands they hear, and are doing

their best to keep consumers dependent on them from closing down. All producers also are hearing from retailers and small consumers, who are trying to get a little coal for domestic purposes. In the speculative market prices continue high, and it is reported that \$9 has been paid in some cases for Clearfield grades, f. o. b. New York Harbor shipping ports. Little speculative coal is available, but speculators are afraid of the market. If car supply becomes better prices will probably fall, and it is thought that even speculators wish lower prices.

Trade in the far East has shown an urgent demand, now somewhat lessened, however, by reported orders placed for Canadian coal. Along Long Island Sound the situation is, if possible, worse than last week. Consumers at New York Harbor points suffer the least, since being nearer the shipping ports they are able to make their demands in person. In the all-rail trade consumers at some points have the greatest difficulty in keeping their plants in operation.

The coastwise vessel market reflects the present demand for coal, and vessels are being put in at the loading ports under charter to wait 6 or even 7 weeks for cargoes. Vessels are scarcer at New York Harbor than below. We quote current rates from Philadelphia as follows: Providence, New Bedford and Long Island Sound, 55@60c.; Boston, Salem and Portland, 65@70c.; Wareham and Portsmouth, 70c.; Lynn, 80@85c.; Newburyport, 80c.; Bath, 70@75c.; Gardiner, 95c. and towages; Bangor, 85c. For the farther lower ports on current quotations for quick loading rates are 15@20c. higher than above figures. For delayed loading rates are according to contract.

Birmingham. Sept. 29.

(From Our Special Correspondent.)

More than 1,000 miners have been idle for some days now, including the 250 who have been idle since July 1, caused by the failure of operators to sign the scale adopted between the Coal Operators' Association and the United Mine Workers of America. Seven hundred men in the employ of the Tennessee Coal, Iron and Railroad Company, at West Pratt, and at No. 3 mines of the Pratt Division, suspended work last week because the company refused to collect from every man at those mines \$1 per week, the assessment called for by the United Mine Workers of America for the strikers in the anthracite districts of Pennsylvania. The company was willing to collect from those members who signified their intention of paying the assessment, but there were about 70 who refused to pay and objected to the company holding out their money. The company claimed that it could not hold out the money if the miner objected, while the organization officers declared that the contract signed stipulated that the company was to collect through its office the legal dues of the union. The question threatens to become a most important one, and there is yet opportunity for an outbreak which may injure the mining industry in this section of the State.

The mines of the Montevallo Mining and Transportation Company at Aldrich, in Shelby County, have resumed operation, the company employing nothing but non-union labor. The differences with the miners at the Coal Creek mines in St. Clair County, have been settled, and the mines there have resumed operation also.

The Louisville & Nashville Railroad has completed a survey to the coal-fields in the western part of Jefferson County and in Walker County, and will shortly let contracts for the construction of the 27 miles of road. The Louisville & Nashville now owns the Birmingham and the Alabama Mineral railroads, which take in a large number of the mines and industries in the northern part of the State, and with the new branch will be in a position to command the entire situation.

There is a strong demand for coke, that product selling as high as \$5.50, and very scarce even at that price. Recently a test was made with coal from the Flat Top Mountain mines, in Walker County, and a fine quality of coke was manufactured.

Chicago. Sept. 28.

(From Our Special Correspondent.)

Wholesale coal business continues to be booming; office forces are striving to keep the retailers satisfied and the orders from the territory west of Chicago are especially heavy. There is no complaint from anyone; prices are high, but consumers are glad to get the only coal available—that from Western bituminous mines. Nearly all Eastern coal is out of the market; this applies to Pocahontas smokeless, West Virginia splint, West Virginia lump and Brazil block. Hoeking is coming forward slowly; its price is now \$3.35, which will be advanced to \$3.50 on Wednesday of this week. Youghiogheny is scarce and quoted at \$3.55. Indiana block and semi-block are practically out of the market; the little that can be got is bought eagerly at \$2.70 and \$2.10 respectively. The big business is being done in the cheaper grades of Indiana and Illinois coal, at \$1.20@2.20. Nearly all consumers are preparing to use these coals for the winter. Illinois manufacturers are putting

large lots of stoves on the market, especially designed to burn bituminous coal; these will probably go far toward reconciling the household consumer to his lot in the coming winter. Blacksmith's coal is scarce and quoted at \$3.50.

Agitation by the maritime interests of Chicago, which are closely associated with the coal trade so far as anthracite is concerned, is apparently about to bring forth some relief for the shipping on the Chicago River, in lowering or removal of the tunnels that have so long obstructed navigation. With 22 ft. everywhere available, except at the tunnels, where the depth is but 17 to 18 ft., commerce has practically a bar placed upon it. The city and sanitary district governments have agreed to join hands in co-operating for the removal of these obstructions. The necessity for this improvement is being forced on the public by the publication of statistics showing that Chicago now holds only fourth place in tonnage (for the first seven months of 1902). It now seems probable that the work of lowering the tunnels will soon be undertaken by one or both of the political bodies mentioned.

Cleveland. Sept. 30.

(From Our Special Correspondent.)

The coal market is increasingly perplexing. In the domestic market the retail dealers have been trying to retain the prices which prevailed during the summer. They have found, however, that the Chicago and Michigan dealers have been overbidding them at the mines and have been taking about all of the coal. The local dealers, of course, had contracts which provided for a certain portion of their soft coal and the dealers were satisfied with modest profits while this material lasted. The necessity of meeting this outside competition at the mines has forced the local retail dealers to compel the consumers to pay the expense of this competition. As a result there has been a horizontal advance of 50c. a ton on all coal from the Massillon District and of \$1.50 on the coal from the Pocahontas District. Anthracite coal here is almost out of the question. It was estimated a few days ago that there is now not to exceed 10,000 tons of hard coal in stock in Cleveland, and those who have contracts are getting their material in dribbles.

The lake situation is equally perplexing. The car supply is wholly inadequate to the needs of the shippers and cargoes are obtained with difficulty. Boats are now being delayed at the docks from two to four or five days awaiting loads, and many of them which would like to carry coal for ballast on the up-bound trips are forced to run light. It is out of the question now for the shippers to come anywhere near filling their contracts with Northwestern dealers. It seems impossible that there should be any material increase in the movement from now on.

Pittsburg. Oct. 1.

(From Our Special Correspondent.)

Coal.—While there seems to be a better supply of cars this week the railroads still have difficulty in moving them, and a large tonnage that should have been at points of delivery remain on side tracks and in yards. Prices are firmer, and all local dealers have ordered an advance. The Monongahela River Consolidated Coal and Coke Company now has nearly 20,000,000 bush. loaded which cannot be sent to the lower markets on account of the low water in the rivers. This company, however, is able to supply the local trade, as the water in the harbor is navigable. It is reported here from Cincinnati that the supply of coal there will be exhausted within the next two weeks, and a famine is predicted unless the trouble in the West Virginia fields is settled and the Monongahela Company is able to ship its big tonnage. Prices at all down river ports have been advanced to a stiff figure during the past week.

Connellsville Coke.—Prices have not been as high as at present for many years. For prompt shipment furnace coke has brought as high as \$5 a ton, and it is reported from the West that \$14 has been asked for Connellsville coke. The circular price of \$2.25 @ \$2.50 for furnace and \$2.75 @ \$3 for foundry remains unchanged. An advance of 50c. over these rates for contract coke for next year is probable. The *Courier* in its last issue gives the production for the previous week at 256,350 tons, a drop of 1 ton compared with the production of the preceding week. The shipments aggregated 12,122 cars distributed as follows: To Pittsburg and river tipples, 3,937 cars; to points west of Pittsburg, 5,922 cars; to points east of Connellsville, 2,213 cars. This was a gain in shipments of 91 cars.

San Francisco. Sept. 27.

(Special Report of J. W. Harrison.)

Since the steamship *Sonoma* sailed September 4, there have been the following coal arrivals from Newcastle, N. S. W.: *Halwood*, 3,258 tons; *Mt. Stewart*, 2,924 tons; *Pellegina O.*, 2,119 tons; *Lime Branch*, 5,600 tons; *Carmanian*, 2,900 tons; *Port Carlisle*, 2,120 tons; *Imp. Alexander II.*, 2,771 tons; *Ancona*, 3,866 tons; *Netherby*, 2,118 tons; total, 27,676 tons. In the intervening time, between the sailing of the

steamer *Sierra*, on August 14, and the steamer *Sonoma*, September 4, there was but one arrival of coal from Australia. Within the same period of time, since the steamer *Sonoma* left, there have been 9 arrivals, with the quantity above named. The quantity of Australian coal delivered here the past 20 days is largely in excess of the quantity consumed within that period; but the conditions for the next several months for Colonial importations will leave us, by the end of this year, with but a very slim amount on hand. There are in all 7 vessels which can possibly arrive here within the next 4 months, with about 22,000 tons of coal. At this same period of 1901, there were 27 vessels loading and on the way from Australia for this port with a carrying capacity of 77,000 tons. This is very forcible evidence of the condition of our local coal requirements, when such a shrinkage as the above can be made within 12 months.

Prices.—Our special correspondent reports prices for Coast coals to dealers as follows: Wellington and Southfield, \$8; Roslyn, \$7; Seattle and Bryant, \$6.50; Coos Bay, \$5.50; white ash, \$5. For Rocky Mountain coals, large lots, quotations are: Castle Gate, Clear Creek, Rock Springs or Sunnyside, \$8.50; Colorado anthracite, \$14. For Eastern and foreign coals, cargo lots, prices are: Pennsylvania anthracite, \$14; Cumberland, \$12; Welsh anthracite, \$13; cannel, \$9; Brymbo, \$7.50; Wallsend, \$6.50.

Foreign Coal Trade. Oct. 4.

Export trade here continues very quiet. Beyond the usual business to the West Indies and South America, very little is being done.

Exports of coal and coke from the United States for the 8 months ending August 31 are reported as follows:

	1901.	1902.	Changes.
Anthracite	1,454,223	626,609	D. 827,614
Bituminous	3,689,273	3,618,453	D. 70,820
Total coal	5,143,496	4,245,062	D. 898,434
Coke	263,051	264,493	I. 1,442
Total	5,406,547	4,509,555	D. 896,992

The coke exported went chiefly to Mexico. The destination of the coal exported is given as follows:

	1901.	1902.	Changes.
Canada	3,563,296	3,010,967	D. 552,329
Mexico	413,561	371,746	D. 41,815
Cuba	252,338	275,743	I. 23,205
West Indies	239,042	216,573	D. 20,069
Belgium	5,577	4,116	D. 1,461
France	146,870	29,328	D. 117,542
Germany	2,659	14,808	I. 12,149
Italy	83,636	82,181	D. 1,455
Holland	610	305	D. 305
Other European countries	136,827	44,523	D. 92,304
Other countries	301,280	195,072	D. 106,208
Total	5,143,496	4,245,062	D. 898,434

The decrease in exports to Canada was entirely in anthracite.

There has been considerable chartering of vessels in Great Britain to carry Welsh coal to the United States. Recently several cargoes arrived here, and orders for more are being taken. The charters booked are at 5s. 6d. to 6s. 6d. (\$1.32@1.56), which are at least 2s. (48c.) less than were paid by American exporters to Europe before the miners' strike interfered with this trade. The Welsh anthracite being imported here carries less than 92 per cent fixed carbon, and so pays the duty of bituminous at 67c. a ton. Adding this duty with the average ocean freight and incidental expenses, the cost of delivering best Welsh steam coal at Philadelphia or Baltimore should not exceed \$6.25 per ton. In fact, it is believed that importations have been made at less than this figure.

Imports of coal into the United States for the 8 months ending August 31 are reported as follows:

	1901.	1902.	Changes.
Canada	992,541	1,058,519	I. 65,978
Mexico	19,117	7,842	D. 11,275
Great Britain	28,893	52,185	I. 23,292
Other European countries	1,787	668	D. 1,119
Japan	2,170	8,176	I. 6,006
Australia	237,446	227,267	D. 10,179
Other countries	22,072	300	D. 21,772
Total	1,304,026	1,354,957	I. 50,931

The larger part of the imports are on the Pacific Coast. The total this year included 18 tons of anthracite only, all the rest being classed as bituminous coal.

Coal production in France for the first half of 1902 is reported as follows: Coal, 15,874,098 metric tons; lignite, 320,417; total, 16,194,515 tons; an increase of 427,384 tons, or 2.7 per cent, over the first half of 1901.

Messrs. Hull, Blyth & Co., of London and Cardiff, report under date of September 20 that the Welsh coal market continues very steady, both for Cardiff and Monmouthshire descriptions. Best qualities seem fully stemmed. Quotations are: Best Welsh steam coal, \$3.96@4.08; seconds, \$3.84; thirds, \$3.60; dry coals, \$3.72; best Monmouthshire, \$3.36@3.48; seconds, \$3.30; best small steam coal, \$2.16; seconds, \$1.98; other sorts, \$1.80.

The above prices for Cardiff coals are all f. o. b. Cardiff. Penarth or Barry, while those for Monmouth-

shire descriptions are f. o. b. Newport, exclusive of wharfage, but inclusive of export duty, and are for cash in 30 days, less 2½ per cent discount.

The freight market remains very quiet, Mediterranean rates are somewhat weaker, while rates to South America and the Islands are slightly firmer. Some rates noted from Cardiff are: Marseilles, \$1; Geroa, \$1.08; Naples, \$1.08; Singapore, \$3.48; Las Palmas, \$1.44; St. Vincent, \$1.62; Rio Janeiro, \$2.88; Santos, \$3.12; Buenos Aires, \$2.64.

IRON TRADE REVIEW.

New York, Oct. 2.

The principal feature in the iron market as shown in our local reports which follow is the weakness in sheets, which has led to a break in prices to the extent of \$5 a ton. This is largely due to the great increase in capacity of the sheet mills, and it is quite probable that this action on the part of the American Sheet Steel Company will throw the independent producers out of the market for the present. In all other lines demand continues very good, and while few new contracts are being closed for material, for the very good reason that most producers are practically out of the market for the next 6 months, there is no apparent cessation in demand. Foreign material continues to come over in considerable quantities, and is generally taken up, although complaints are heard here and there about quality, especially with pig iron. It is understood that besides the actual purchases options have been taken on considerable quantities of German pig iron for delivery in December and January if required. With the exception of the break in sheets, prices show no material change.

A Philadelphia dispatch says that the Custom House authorities there have decided that the basis upon which duties are to be collected on imported iron and steel ought to be the real market price paid in Germany, and not the special price which manufacturers are making there for export business. It does not appear upon what rule of law or otherwise such a decision can be based. The price made for export and actually paid by buyers would seem to establish a basis beyond which the Custom House cannot go legally. The prices paid by other consumers seem to be entirely out of the question. It is possible, however, that there is an error in this dispatch, and further advices are awaited before making extended comments.

Birmingham. Sept. 29.

(From Our Special Correspondent.)

There is some demand yet for pig iron, even at extraordinary prices, but the furnacemen in this section are not anxious to sell, and, indeed, have very little iron to sell. Spot iron brings \$25, except when sold to regular customers in small lots. Some inquiry is being received for iron to be delivered during the second half of the coming year.

Shipments from this district have been steady. Production in the district was a little off last week, as the Sloss-Sheffield Steel and Iron Company closed down one of its city furnaces for some needed repairs. Before the end of this week, however, the furnace will be in operation again.

The following quotations are given: No. 1 foundry, \$19@20; No. 2 foundry, \$18@19; No. 3 foundry, \$17@17.50; No. 4 foundry, \$16@16.50; gray forge, \$15@16; No. 1 soft, \$19@20; No. 2 soft, \$18@19.

There is much activity noted in steel and in finished iron and steel circles. The rolling mills are working steadily. There is need for more men. Mr. John D. Dwyer, formerly superintendent of the Birmingham mills, has taken charge of the Anniston mills of the Southern Car and Foundry Company, as superintendent. The mills will go on double turn this week. Mr. Dwyer takes about 60 men from the Birmingham, Gate City and Bessemer mills to Anniston with him. The machine shops and foundries are still being troubled by the strike of machinists, blacksmiths and boiler-makers. Men are being imported from New Orleans, Louisville and Cincinnati.

No. 3 furnace of the Republic Iron and Steel Company at Thomas, is doing remarkably well, and 300 tons a day is now being averaged. On Thursday the furnace turned out 328 tons of pig iron, of which 196 tons were No. 2 foundry.

Buffalo. Oct. 1.

(Special Report of Rogers, Brown & Co.)

The condition of the local iron market seems to be a little easier, owing to the imported irons which most foundries have been forced to purchase, delivery of which is now being made. We are in receipt this week, however, of enquiries for domestic irons for delivery during the first half of next year which aggregate quite a large tonnage; and in some instances buyers seem to want to secure irons which they know to be satisfactory for delivery throughout 1903. It appears more evident that the choice domestic brands which are popular in this district are largely bought

up until at least July 1, 1903. Interest among foundrymen seems more keen in regard to coke than over deliveries of iron, now that they can secure reasonably prompt deliveries on imported brands. It is almost impossible to obtain sufficient fuel, and enquiries for coke to supplement present contracts develop the fact that there is little to be obtained and that little is held at prices which seem high when compared with old contracts, but which really are conservative when the demand is taken into account. We quote below on the cash basis, f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$25.75; No. 2, \$25.25.

Chicago. Sept. 28.

(From Our Special Correspondent.)

The lack of coke continues to tie up furnaces and foundries alike. During the last week the price of coke has averaged about \$12, as for the previous two or three weeks, but consumers report more difficulty in getting the fuel. There are South Chicago furnaces that have been closed for three weeks that have no good prospect of being opened this winter unless the strike shall be settled. Foundries are generally unsettled; those that are operating are in doubt as to the future, and cannot make contracts for either raw material or finished products. Sales of pig iron are naturally light in consequence of the uncertainty and lack of coke. All sales of course are being made for next spring; there is no iron to be had this year except a chance and small lot here and there. Quotations to-day are as follows: No. 1 Northern, \$23.50@24; No. 2 Northern, \$23@23.50; No. 3 Northern, \$22.50@23; No. 1 Southern, \$23.65@24.16; No. 2 Southern, \$23.15@23.65; No. 3 Southern, \$22.65@23.15. The price of Southern varies greatly; No. 2 sells from \$22.65@29.15 Chicago, depending on the size of the lot and time of delivery. The general quotations for Southern may be taken as an average.

To some sellers of pig iron the present condition is not bad, but rather good for the trade, provided it does not last too long. The furnaces are going ahead to the best of their ability to deliver iron bought six to nine months ago; providing these contracts can be fulfilled, there is no occasion for worry on the part of the furnacemen for five or six months. Not a few of those dealing in iron believe that a shortening of the time between the date of ordering and of delivering will be in the end beneficial to both furnaces and foundry proprietors.

Foreign iron, it is reported, is steadily gaining in sales for the Chicago District, though there is complaint about the absorption by the East of large importations. With no Northern or Southern iron certainly in view, it seems probable that the sales of imported iron will increase rapidly.

Cleveland. Sept. 29.

(From Our Special Correspondent.)

Iron Ore.—The speed of iron ore shipments for the present season continues, the incentive being the supplying of the demand of the furnaces, which will likely start operations about the first of the year, and also others, which will go in blast between January 1 and May 1. The rates of carriage are on the point of advancing to keep pace with an advance in rates of grain, but for the present the old quotations prevail, namely: 75c. from Duluth; 65c. from Marquette, and 60c. from Escanaba.

Pig Iron.—Several furnaces in the Valleys have banked their fires during the past week, and production is further curtailed. Consumers having contracts have been begging the general market for material, and not being able to procure it have gone abroad, taking the inferior material in preference to being without. The import price is \$23.50, with a tendency to shade that, while domestic prices are at least \$25, Valley furnace, but with the producers in a position to dictate terms. The demand for iron for delivery during the first half of next year has not slackened, and, in fact, the pace kept up until now has further indicated to the producers that the shortage next year will be fully as severe as this year, if not more so. The furnaces are quoting \$22, Valley furnace, for first half delivery, but are saying nothing about the third quarter. It is expected that the introduction of so many new furnaces will break down the market during the third quarter. Bessemer pig has been sold at \$23, Valley furnace, during the week; this, however, was done by a producer not included in the association, the latter having taken no action on prices for second quarter delivery next year. Basic producers are off the market, but the consumers are after material and are willing to pay \$21 for it. The limited material alone prevents the consummation of numerous orders.

Finished Material.—The stock prices on plates have been advanced during the past week. Sheared plates out of stock are now bringing 2.50c., whereas a week ago the price was 2.24c. Sheared and universal plates are now bringing the same price. The smaller mills still have some material which they can offer for sale during the remainder of the season, deliveries being offered in 6 weeks. The price asked is 2c. at the mill. No big sales at the association price of 1.60c. have

been made for next year's delivery, nor have any sales been made past the first of the year at premium prices. One order of 1,000 tons of structural shapes was placed during the week with one of the Pittsburgh mills at 1.60c. Pittsburgh, the old association price. Jobbers, however, are getting 2.50c.@3c. for shapes for immediate shipment, and the smaller mills are getting 2.60c. at the mills for their material. The sheet mills took in a number of orders recently at reduced prices, and immediately afterwards stiffened the market and began to demand the old scale of prices, which on black sheets is based on 3.10c.@3.20c. for No. 27 at the mill, and 3.35c.@3.50c. out of stock. Tin-plate mills are easing upon production to some extent, and the billets, which would have been thrown upon the market otherwise, are being used in the production of bessemer steel, which is being used largely in place of open-hearth. This is at once strengthening the tin-plate situation and also relieving the mills of the necessity of meeting the foreign competition on bessemer billets, that product being sold delivered at \$28. The bar situation is unchanged, the steel product having been sold up for the remainder of this year, with a few orders taken entailing deliveries into next season. The prices remain unchanged at 1.60c. Pittsburgh for bessemer, and 1.70c. Pittsburgh for open-hearth. Bar iron is a little off, although the nominal quotations are still 1.80c. Pittsburgh; this, however, could be shaded materially if a choice order were presented.

Philadelphia. Oct. 2.

(From Our Special Correspondent.)

Pig Iron.—Scarcely any business can be reported in domestic pig iron. The same conditions prevail as heretofore regarding foreign material. Supplies are arriving. Orders are being placed with importers, who say that the pressure for foreign material is on the increase, and that the amounts ordered are smaller, but owing to the larger number of buyers the aggregate is greater. There is a very uncertain feeling in this market over pig iron, and it is impossible to give an intelligent review of the market either with respect to domestic or foreign. There are a number of buyers waiting for opportunities to place contracts for foundry. Several consumers have been met with this week who are almost in distress over iron for early delivery, to say nothing of the influence which the fuel problem is exerting. Scotch irons are quoted at \$23, though this price varies. Middlesboro iron is worth about \$21, though it is said that \$19.75 has been named for a large lot. These figures do not include drayage. Basic iron is worth about \$20.50 for the best delivery which can be had; forge iron is very strong, but there is no evidence that business has been done during the past three or four days; low phosphorus is practically out of the market; No. 1 foundry is quoted to-day at or near \$24; No. 2 \$22.50; plain, \$22; standard gray forge, \$20.

Steel Billets.—Open-hearth billets have been quoted at \$28@30. Importers say that they will book business at \$27.25 for imported bessemer billets.

Muck Bars.—Further sales of muck bars have been made and inquiries are improving.

Merchant Bar.—Refined iron is selling in a small way at 2.30c.; in a large way at 2@2.10c. Steel bars are quoted at 2.20@2.30c. for early delivery; lower prices would be named where large orders are to be had.

Sheets.—The business in sheet iron appears to be falling off among the larger consumers, owing to reported concessions, but these reports emanate from Western sources, and relate to large quantities. Our local sellers are getting their usual prices, and they do not attach much importance to the repeated rumors that sheet is likely to weaken. At the same time there is not the same anxiety shown even among our small buyers to secure material, a fact which is due to the amount of material they have under contract for delivery during the next 60 days.

Pipes and Tubes.—There is no weakness in pipes or tubes, nor is there any disposition among manufacturers to yield an iota in order to get business. The reports from the mills to-day are that capacity is fully engaged, and that there are no visible signs of any other condition.

Merchant Steel.—Eastern buyers are not making any apparent effort at present to buy heavily, although they are assured by agents representing mills that the conditions are against any weakening of prices for months to come. The feeling exists among buyers that merchant steel for delivery after January 1 will be lower; but this impression is probably due to the talk about expanding capacity in the West. The actual sales that have been made here this week are at the usual top prices.

Skelp Iron.—Only a little business has been done this week in skelp iron, and at prices which indicate that premium quotations have gone out of date.

Plates.—The information available to-day regarding plate iron may be summarized in the statement

that the increasing local demand for small lots is quite heavy, in fact, beyond the ability of mill men to meet them. The number of small buyers has been increasing since September 1, and they never stop to talk about quotations provided they can get the material when they want it. Our manufacturing interests agree on the essential fact that the general situation is as strong now as it was during the summer. The fact of the matter is that more or less plate orders are being turned down, and no explanations given. Representative plate-mill men are of the opinion that plates are more likely to advance on small buyers than to weaken. Quotations are 2.10 @2.20c. for small lots; ¼-in. plate is bringing 2@2.10c. readily, and even higher prices were offered this week. Universals are 2.10c.; flange, 2.20c.; fire-box, 2.30c. The orders for fire-box are very urgent, and a good deal of this sort of material is being turned out.

Steel Rails.—The only business that can be traced up in steel rails shows that \$28 is a nominal figure when it comes to urgent deliveries. The only inquiries that have been heard of this week are for unusually heavy sections intended for yard purposes and in localities where the traffic is very heavy. Rail-makers say that a good many lighter sections are being taken up and heavier sections put in their place.

Old Rails.—Old rails are nominally \$26 for iron and \$22 for steel. Those who handle old rails say they have urgent orders for a great deal more material than it is in their power to furnish.

Scrap.—The week has been quieter in heavy scrap, because there is none to be had. Heavy steel is quoted at \$21; best railroad scrap, \$25; country scrap, \$22; low phosphorus scrap anywhere from \$27 @30; machinery cast, \$20; wrought turnings, \$19 for heavy stuff.

Pittsburg. Oct. 1.

(From Our Special Correspondent.)

The main development in the iron and steel markets of the week is that the United States Steel Corporation has begun to go after the trade of its competitors. As has already been told, this big combine is in a position to meet all conditions, and if there is not enough business to go around, it is able to secure what is required to keep its mills in operation. Despite the fact that trade in sheets has been dull for some time it has been scattered among the many mills, and all had to meet the prices established by the American Sheet Steel Company, which is a part of the big steel corporation. This concern has just made a cut of \$5 a ton in the price of sheets, fixing the rate for No. 28 gauge at 2.75c., instead of 3c. It is stipulated, however, that this unusually low price is for orders placed at once, accompanied by specifications as to sizes and gauges. There are too many sheet mills, and this line has been in a very demoralized condition for some time past. It is claimed in the trade that the independent sheet mills that do not make their own steel cannot meet the cut price of the sheet combine, and that there are but three concerns that will be able to continue in the market at the low price of sheets and the high price of steel. They are the Allegheny Steel and Iron Company, with works at Avenue, near Pittsburg; the American Rolling Mill Company, of Middletown, O., and the Youngstown Iron, Tube and Sheet Company, of Youngstown, O. The weakness in the wire market has also been noted, prices being down to bed-rock, but even in this line some heavy shading has been done from the bottom prices, cuts of from \$1 to \$2 a ton having been made. The lowest quotation on plain wire has been 1.95c. and on wire nails \$2 a keg. These remarkably low prices have been shaded by the American Steel and Wire Company, it is reported, to such an extent that mills not making their own steel will be forced out of the market. Wire rods remain firm at \$35.50 a long ton, and producers are standing by the United States Steel Corporation with the result that small concerns are the sufferers.

The only line in which the big steel combine has so far been unable to get enough business to keep its mills in full operation is tin-plate, and it is predicted that it will soon find trade to warrant a general resumption. At present fully 50 per cent of its tin-plate mills are idle, due to a lack of orders. Great secrecy has been observed regarding the latest move made by the American Tin-Plate Company. A conference with the Scale Committee of the Amalgamated Association of Iron, Steel and Tin Workers began at the combine headquarters in New York on Monday. It is understood that some plan will be agreed upon that will enable the company to secure the rebate export trade or that will put it in a better position to compete with the independent producers in the local markets.

There is a noticeable improvement in pig iron production. Deliveries are better, and the demand for prompt iron is not so great as it has been as a result. The supply of coke at the furnaces continues to improve daily, and there is but little complaint regarding fuel. The improved production of pig iron here and the unsatisfactory quality of the

foreign article has resulted in the countermanding of some large orders placed abroad. It is reported that fully 100,000 tons of foreign iron is under option, but it was only intended to take it if absolutely necessary. The Sharon Steel Company, with a large plant at Sharon, Pa., has just decided to erect another blast furnace to cost about \$750,000, and which will have a daily capacity of 400 tons. The contract for three blowing engines was awarded to Mackintosh, Hemphill & Company, of this city. It is expected that the new furnace will be put in blast about July 1.

Pig Iron.—Nearly all the blast furnaces in the Pittsburgh District and in the Valleys are producing their full capacity. Unless some difficulties arise that are not expected the furnaces will not be so far behind in deliveries at the end of the year, as was anticipated several weeks ago. Some small lots of different grades of pig iron were sold during the week, and prices remain practically unchanged. Bessemer for delivery this year is quoted at \$22, and for next year \$21.50, Valley furnaces. Foundry No. 2 is not in great demand, but the price for quick delivery is firm at \$23.50, and \$22.50, Pittsburgh, is quoted for next year. Gray forge is weaker, and \$20.50 to \$21, Pittsburgh, is now quoted.

Steel.—The steel market is extremely quiet, and bessemer steel billets for a desirable order can be had at \$30. There is but little demand for open-hearth steel, and on a firm order \$31, or probably better, could be done. The plate market continues active, and another effort is to be made by independent mills to put up prices. The plate pool, which has not met since last spring, is scheduled to meet in New York on October 8. Unless the United States Steel Corporation objects, the price of 1.60c. that has ruled all year will be advanced. The corporation cannot make deliveries on new business before April 1, while some independent producers can accept orders for this year. The American Shipbuilding Company, of Cleveland, is reported to have placed an order calling for about 13,000 tons of plates and shapes with the Carnegie Company and the Jones & Laughlin Steel Company. Steel bars are still quoted at 1.60c.

Sheets.—The unsatisfactory condition of the sheet market has resulted in a cut in prices of \$5 a ton by the American Sheet Steel Company. No. 28 gauge is quoted at 2.75c. and galvanized sheets at 75 and 10 per cent off.

Ferro-manganese.—There is no domestic 80 per cent in the market. The price of the foreign product is lower this week, being quoted at \$51 to \$51.50.

New York. Oct. 3.

Pig Iron.—There has been no material change in the market. We quote for 1903 delivery, Northern irons at tidewater: No. 1X foundry, \$23@25.50; No. 2X, \$22@23; No. 2, plain, \$21@22. For Southern iron on dock, New York, No. 1 foundry, \$23 @23.50; No. 2, \$22@22.50; No. 3, \$21@22. Middlesboro pig is quoted at \$19.50.

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

Plates.—The market continues strong. We quote for tidewater delivery in car-loads: Tank, ¼-in. heavier, 2@2.20c.; flange, 2.15@2.25c.; marine, 2.25 @2.50c.; universal, 2@2.20c. Deliveries can be had in about 6 weeks from date of order at some eastern mills.

Steel Rails.—Standard sections are still quoted at \$28, f. o. b. mills for 1903 delivery; light rails, \$30@ \$35, according to weight. Relaying rails are \$28@ \$30 for heavy sections, and \$33@35 for light sections.

Structural Material.—The outlook for months ahead favors a very strong market. We quote for large lots at tidewater: Beams, angles, channels and tees, 2c.@2.20c. For small lots and prompt delivery good premiums are paid.

CHEMICALS AND MINERALS.

(See also wholesale prices-current on page 474.)

New York. Oct. 2.

Business is centered in future orders, which are being taken generally at less than prompt delivery prices. Raw materials are high, owing to agreement between producers, who intend to keep up prices by curtailing the output, especially of brimstone and nitrate of soda. Eventually consumers' demands will be regulated accordingly, and then the various combines will have to reform their policy. Manufactured products, owing to keen competition, do not generally reflect the firm market for raw materials, consequently profits are being cut to a low margin.

Heavy Chemicals.—Alkali and caustic soda find good buyers for next year's delivery at quotations below, but bleaching powder continues weak, and contract sales of chlorate of potash are being made at fractionally less than ruling market prices.

Imports of heavy chemicals in the 8 months ending August 31 were as follows, in lbs.:

	1901.	1902.	Changes.
Alkali	17,182,313	17,489,567	I. 307,254
Caustic soda.....	2,310,960	2,345,124	I. 34,164
Sal Soda.....	3,097,858	2,493,844	D. 604,014
Bicarb. soda, etc.....	9,559,745	10,040,089	I. 480,344
Bleaching powder.....	69,846,657	80,456,925	I. 10,610,268
Chlorate of potash.....	498,526	982,233	I. 483,707

These imports were principally from Great Britain and Germany.

Domestic chemicals, we quote, per 100 lbs. f. o. b. works, as follows: High-test alkali, in bags, 82½¢@87½¢, for prompt shipment, and 77½¢@85¢, for forward; caustic soda, high-test, \$1.90@1.95 for early delivery, and \$1.80@1.87½ for futures; bicarb. soda, ordinary, \$1, and extra, \$3; sal soda, 65¢; chlorate of potash crystals, \$7.75 for immediate shipment, and \$7¼ for contracts. For foreign goods, we quote per 100 lbs. in New York: Alkali, high-test, 90¢@92½¢; caustic soda, high test, \$2.25; sal soda, 67½¢@74¢; bicarb. soda, \$1.50@1.60; chlorate of potash, \$8.12½@8.25 for prompt, and \$7¾@7½ for forward; bleaching powder, prompt, prime brands, Liverpool, \$1.75; Continental, \$1.60@1.65, contracts at less.

Acids.—Contract deliveries absorb attention, and in sulphuric and muriatic acids show an improvement. Oxalic is still unsettled. Blue vitriol is almost inactive, owing to the curtailed export demand. Exports of blue vitriol from the United States in August were 373,906 lbs., being the second smallest quantity reported this year. In the 8 months ending August 31 the exports totaled 29,730,278 lbs., as against 46,772,316 lbs. in the same time last year; showing a decrease of 17,042,038 lbs., due chiefly to the curtailed consumption in Italy and Austria.

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

	1901.	1902.	Changes.
Blue vitriol.....	\$4.60@5.00	Oxalic, com'l.....	\$4.50@5.00
Muriatic, 18 deg.	1.50	Sulphuric, 50 deg.,	bulk, ton.....
Muriatic, 20 deg.	1.62½	bulk, ton.....	13.50@15.50
Muriatic, 22 deg.	1.75	Sulphuric, 60 deg.	1.05
Nitric, 36 deg....	4.00	Sulphuric, 60 deg.,	bulk.....
Nitric, 38 deg....	4.25	bulk.....	18.00@20.00
Nitric, 40 deg....	4.50	Sulphuric, 66 deg.,	1.20
Nitric, 42 deg....	4.87½	Sulphuric, 66 deg.,	bulk.....
		bulk.....	21.00@23.00

Brimstone.—Business is quiet, deliveries being principally on contract. Spot best unmixed seconds are quoted at \$23@23.25 per ton, while shipments are held at \$22.75@23, according to position. Best thirds are about \$1.75 less than seconds. Imports at New York this week were 2,575 tons from Sicily. A small cargo of Venezuela sulphur arrived at this port last week, being the first consignment from the mines of the German Venezuelan Sulphur Company, near Carupano.

Imports of brimstone into the United States in August were 15,666 tons, showing an increase over the two previous months. In the 8 months ending August 31 the imports totaled 111,578 tons, as against 105,761 tons in the same period last year; showing an increase of 5,817 tons, credited principally to the paper trade.

Exports of brimstone from Sicily in August were 43,383 tons, against 23,296 tons last year; an increase of 20,087 tons, making this the third best month this year. Notwithstanding these large exports, stocks in Sicily have been fast accumulating, and on August 31 amounted to 306,502 tons, which is the largest total since February, and shows an increase of 71,980 tons over August, 1901. Contrary to general belief, production has fallen off somewhat, judging from the statistics that are available. In fact, the decrease in output is larger than the falling off in exports this year.

Pyrites.—Imports from Spain continue on a good scale, and this week 4,584 tons were reported at New York. At present f. o. b. prices in Spain and an ocean freight of, say, 10s., the market value at Atlantic ports should be not far from \$5 a ton for the average grade of pyrites. Doubtless contracts could be made at less if the quantity was large enough to permit the chartering of a steamer. Business in Spanish pyrites has become very extensive in recent years, owing to the high price of brimstone. Imports into the United States in August were 32,689 tons, showing an increase of 1,120 tons over July. In the 8 months ending August 31 the imports were 283,252 tons, against 264,252 tons in the corresponding period last year. The increase of 19,000 tons is equal to 9,120 tons sulphur. The bulk of these pyrites has been consumed by sulphuric acid manufacturers, who do a large business in the fertilizer industry.

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

Sulphate of Ammonia.—Little doing to influence prices. Spot gas liquor is held at \$3@3.02½ per 100 lbs., and shipments at \$2.95@2.97½.

Nitrate of Soda.—A sudden demand for nitrate of soda in Europe has caused an advance in Chilean freights and prices. Consequently importers look for higher prices here. Spot is quoted at \$1.90 per 100

lbs., and shipments \$1.82½@1.85, according to position.

Phosphates.—Competition is keen, even in those districts where unanimity was supposed to be strongest. Consequently prices for 1903 and 1904 contracts are being shaded. With few exceptions mining is active, and the output is considered satisfactory. In Florida miners are busy, and although comparatively little stuff was shipped in August, the movement in September has been good. Port Inglis has been opened, and the first vessel loading was the British steamship *Thermisto*, with 3,300 tons high-grade rock for Hamburg, Germany, shipped by the Dunnellon property. Tennessee shows increased activity in Mt. Pleasant and newer districts, and miners are taking some good orders for export. In South Carolina the situation has been improved by reduced stocks, which fact is partly explained by the withdrawal of the Coosaw Company. The three companies now at work are the Central, Beaufort and Empire, all of which are doing a satisfactory business. The field abandoned by the Coosaw Company may be worked again, as it is believed the deposits are not yet exhausted. This company had 500 tons of rock on hand when it stopped work. In the whole South Carolina field stocks on August 31 were 38,736 tons, as against 61,339 tons last year, showing a falling off of 22,593 tons, or 36.3 per cent.

In August the United States exported 39,572 tons of phosphates, showing this to be the smallest month since January, when 34,910 tons were reported. In the 8 months ending August 31 the exports amounted to 495,988 tons, as against 507,613 tons in the corresponding period last year, showing a decrease of 11,615 tons. The bulk of these exports was in Florida high-grade rock, which is largely consumed in Germany.

Phosphates.	Per ton F. o. b.	United Kingdom or European Ports.	
		Unit.	Long ton.
*Fla. hard rock (78@80%)	\$6.50@7.00	6¼@6¼d.	\$9.80@9.88
*Fla. land pb. (68@73%)	3.00@3.25	4¼@5d.	6.65@7.00
*Tenn., (78@82%) export	3.25@3.50	5½@6d.	8.58@9.36
*Tenn., 78% domestic	3.00		
*Tenn., 75% domestic	2.75@3.00		
*Tenn., 73@74% domestic	2.30@2.40		
*Tenn., 70@72% domestic	2.10@2.25		
So. Car. land rock	3.25@3.50	4¼@5d.	5.67@6.30
So. Car. river rock	2.75@3.00		
Algerian (63@68%)		5½@6¼d.	7.15@8.13
Algerian (58@63%)		5@5¼d.	6.00@6.90
Algerian (53@58%)		4¼@5d.	5.32@5.58
*Fernandina, Brunswick or Savannah.			
†Mt. Pleasant. †On vessels, Ashley River.			

Liverpool. Sept. 23.
(Special Report of Joseph P. Brunner & Co.)

A steady business is passing at the recent quotations. Soda ash prices, for tierces, may be called about as follows: Leblanc ash, 48 per cent, £5 15s. @£6; 58 per cent, £6 2s. 6d. @£6 7s. 6d. per ton, net cash; ammonia ash, 48 per cent, £4 5s. @£4 10s.; 58 per cent, £4 10s. @£4 15s. per ton, net cash. Bags, 5s. per ton under price for tierces. Soda crystals are in good request, at generally £3 7s. 6d. per ton, less 5 per cent, for barrels, or 7s. less for bags, with special terms for certain export quarters. Caustic soda is quoted: Sixty per cent, £8 15s.; 70 per cent, £9 15s.; 74 per cent, £10 5s.; 76 per cent, £10 10s. per ton, net cash. Bleaching powder is inactive on spot, and prices are nominal at about £6 12s. 6d. @£6 15s. per ton net cash for hardwood. For 1903 delivery there is not much doing, most of the home consumers having already placed their contracts. Chlorate of potash is dull, at nominally 3d. per lb. net cash. Bicarb soda is unchanged and selling at £6 15s. per ton, less 2½ per cent, for the finest quality in 1 cwt. kgs., with usual allowances for larger packages, also special quotations for a few favored markets. Sulphate of ammonia for prompt delivery is quoted at £12 10s. @£12 12s. 6d. per ton, less 2½ per cent, for good gray, 24@25 per cent in double bags f. o. b. here. Nitrate of soda is selling to a limited extent on spot at £8 15s. @£9 per ton, less 2½ per cent, for double bags, f. o. b. here, as to quality.

METAL MARKET.

New York, Oct. 2.

GOLD AND SILVER.

Gold and Silver Exports and Imports.

At all United States Ports in August and Year.

Metal	August.		Year.	
	1901.	1902.	1901.	1902.
Gold:				
Exports.....	\$150,861	\$2,305,414	\$32,517,346	\$30,465,590
Imports.....	3,490,528	1,269,914	23,494,611	15,871,612
Excess, I.	\$3,339,667	E. \$1,935,500	E. \$9,922,596	E. \$14,594,378
Silver:				
Exports.....	\$4,390,497	\$4,741,968	\$36,653,246	\$30,941,816
Imports.....	2,598,378	1,763,134	20,295,917	16,440,419
Excess, E.	\$1,792,119	E. \$2,978,834	E. \$16,357,329	E. \$14,501,397

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

Gold and Silver Exports and Imports, New York.

For the week ending October 12 and for years from January 1, 1902, 1901 and 1900:

Period.	Gold.		Silver.		Total Excess Exports or Imports.
	Exports.	Imports.	Exports.	Imports.	
Week ...	\$2,000	\$1,191,154	\$925,046	\$6,580 I.	\$270,688
1902.....	24,522,118	3,004,546	19,656,089	930,828 E.	40,242,893
1901.....	25,808,029	3,404,055	24,064,721	2,872,966 E.	43,595,729
1900.....	36,458,589	1,850,120	29,662,555	3,830,216 E.	60,730,868

Exports were principally in silver to London, and imports chiefly in gold from Europe.

Financial Notes of the Week.

The flurry in Wall Street has been checked by the action of the Treasury, which is meeting with very severe criticism. General business was not affected by the reaction in the speculative markets, and there appears to be no good reason why measures of doubtful legality should be taken to relieve Wall Street from the consequences of reckless over-speculation. The arrival of \$2,200,000 of the gold borrowed from Europe is reported this week.

The statement of the New York banks, including the 59 banks represented in the Clearing House, for the week ending September 27 gives the following totals, comparison being made with the corresponding weeks of 1901 and 1900:

	1900.	1901.	1902.
Loans and discounts.....	\$817,472,600	\$867,609,700	\$874,181,800
Deposits	884,706,800	936,452,300	876,519,100
Circulation	29,865,700	30,672,500	35,077,900
Specie	169,156,400	178,936,900	151,980,800
Legal tenders.....	64,962,900	71,469,200	70,385,600
Total reserve.....	\$234,119,300	\$250,406,100	\$222,366,400
Legal requirements.....	221,176,700	234,113,075	219,129,775
Balance, surplus.....	\$12,942,600	\$16,293,025	\$3,236,625

Changes for the week, this year, were increases of \$316,600 in circulation, \$1,973,600 in specie, and \$1,594,575 in surplus reserve; decreases of \$13,352,600 in loans and discounts, \$12,351,900 in deposits, and \$142,900 in legal tenders.

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

	1901.		1902.	
	Gold.	Silver.	Gold.	Silver.
N. Y. Ass'd.	\$178,936,900	.....	\$151,980,800	.....
England	198,188,455	.....	186,761,740	.....
France	477,586,130	\$223,065,460	518,982,205	\$223,101,395
Germany	149,480,000	58,130,000	179,995,000	66,575,000
Spain	70,020,000	85,625,000	71,315,000	97,455,000
Neth'l'd's	30,621,000	28,219,500	23,708,000	32,792,500
Belgium	15,473,500	7,736,500	16,106,665	8,053,335
Italy	79,340,000	9,852,000	80,310,000	10,324,000
Russia	341,975,000	33,960,000	360,355,000	40,050,000

The returns of the Associated Banks of New York are of date September 27 and the others September 25, as reported by the *Commercial and Financial Chronicle* cable. The New York banks do not report silver separately, but specie carried is chiefly gold. The Bank of England reports gold only.

Silver has receded to 23 9-16d. under pressure of special sales. The market, however, does not show much animation, and much higher prices are not apparent from the present reading of conditions.

The United States Assay Office in New York reports receipts of 88,000 oz. silver for the week.

Shipments of silver from London to the East for the year up to September 18 are reported by Messrs. Pixley & Abell's circular as follows:

	1901.	1902.	Changes.
India	£5,705,410	£4,523,470	D. £1,179,940
China	590,212	149,550	D. 440,662
The Straits.....	100,726	327,420	I. 226,694
Totals	£6,396,348	£5,002,440	D. £1,393,908

Arrivals for the week, this year, were £130,000 from New York, £15,000 from the West Indies, and £8,000 from Australia; total, £153,000 in bar silver. Shipments were £67,500 to Bombay, £8,000 to Calcutta, and £1,160 to Colombo; total, £76,660 in bar silver.

Indian Exchange has been somewhat firmer, and the Council bills offered in London were placed at an average of 15.97d. per rupee. The strength is due chiefly to more favorable crop reports. There has been very little buying of silver in London on Indian account.

The coinage executed at the mints of the United States in September is reported by the Bureau of the Mint, Treasury Department as follows:

Denomination	September, 1902.		September, 1901.	
	Pieces	Value	Pieces	Value
Dougle eagles	134,024	\$2,680,480	4	\$80.00
Eagles	50,015	500,150	244,003	2,440,030.00
Half-eagles	76,027	380,135	332,095	1,660,025.00
Quar. eagles	38	95	17	42.50
Total, gold	260,104	\$3,560,860	576,029	\$4,100,197.50
Dollars	2,754,050	2,754,050	3,508,085	3,508,085.00
Half dollars	60	30	212,085	106,042.50
Quar. dollars	60	15	312,085	78,021.25
Dimes	770,090	77,009	2,073,757	207,375.70
Total silver	3,524,240	\$2,831,165	6,106,012	\$3,899,524.45
Five cent nickels	5,586,000	279,300	2,301,200	115,060.00
One cent bronze	9,079,000	90,790	4,504,000	45,640.00
Total, minor	14,665,000	\$370,090	6,865,200	\$160,700.00
Total coinage	18,449,344	\$6,762,115	13,547,241	\$8,160,421.95

The coinage this year shows a falling off of \$1,398,307 in gold and silver; the minor mintage increased.

The foreign merchandise trade of France for the 8 months ending August 31 is reported by the Ministry of Commerce as follows:

	1901.	1902.
Imports	Fr. 2,956,621,000	Fr. 2,942,964,000
Exports	2,627,525,000	2,742,626,000
Excess, imports	329,096,000	200,338,000

There was a decrease of 13,657,000 fr. in imports; an increase of 115,101,100 fr. in exports, and a resulting decrease of 128,758,000 fr. in the balance of imports.

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars	\$0.40	\$0.42
Peruvian soles and Chilean pesos	.38 $\frac{3}{4}$	.42
Victoria sovereigns	4.85	4.88
Twenty francs	3.85	3.88
Twenty marks	4.74	4.80
Spanish 25 pesetas	4.78	4.82

OTHER METALS.

Daily Prices of Metals in New York.

Sept.-Oct.	Silver			Copper			Spelter			
	Sept. Exchange	N. Y. Cts.	London Pence.	Lake Cts. per lb.	Electrolytic per lb.	London per ton	Th. cts. per lb.	Lead per lb.	N. Y. cts.	St. L. cts.
26	4.8535	51 $\frac{3}{4}$	23 $\frac{3}{4}$	11 $\frac{3}{4}$	11 $\frac{3}{4}$	52 $\frac{3}{4}$	26	4.05	5.45	5.20
								@4.10	@5.50	@5.25
27	4.8575	51 $\frac{3}{4}$	23 $\frac{3}{4}$	11 $\frac{3}{4}$	11 $\frac{3}{4}$	52 $\frac{3}{4}$	26	4.05	5.45	5.20
								@4.10	@5.50	@5.25
28	4.8550	51	23 $\frac{1}{2}$	11 $\frac{3}{4}$	11 $\frac{3}{4}$	52 $\frac{3}{4}$	26	4.05	5.45	5.20
								@4.10	@5.50	@5.25
30	4.8550	50 $\frac{3}{4}$	23 $\frac{3}{4}$	11 $\frac{3}{4}$	11 $\frac{3}{4}$	52 $\frac{3}{4}$	26	4.05	5.45	5.20
								@4.10	@5.50	@5.25
1	4.8560	51 $\frac{3}{4}$	23 $\frac{1}{2}$	11 $\frac{3}{4}$	11 $\frac{3}{4}$	52 $\frac{3}{4}$	25 $\frac{3}{4}$	4.05	5.45	5.20
								@4.10	@5.50	@5.25
2	4.8575	50 $\frac{3}{4}$	23 $\frac{3}{4}$	11 $\frac{3}{4}$	11 $\frac{3}{4}$	52 $\frac{3}{4}$	25 $\frac{3}{4}$	4.05	5.45	5.20
								@4.10	@5.50	@5.25

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

Copper has ruled quiet but steady throughout the week, and there is no news of special interest. The range of prices has been within narrow limits, and at the close we quote lake 11 $\frac{3}{4}$ @11 $\frac{3}{4}$ c.; electrolytic in cakes, wirebars or ingots, 11 $\frac{3}{4}$ @11 $\frac{3}{4}$ c.; cathodes, 11 $\frac{3}{4}$ @11 $\frac{3}{4}$ c.; casting copper, 11 $\frac{3}{4}$ @11 $\frac{3}{4}$ c.

The market for standard, which closed last week at £52 7s. 6d., opened on Monday at £52 2s. 6d., and the closing quotations on Thursday are cabled as £52 5s. @£52 7s. 6d. for spot and £52 7s. 6d.@£52 10s. for three months prompt.

Statistics for the second half of September show a decrease in the visible supplies of 600 tons.

Refined and manufactured sorts we quote: English tough, £55@£55 10s.; best selected, £55 10s.@£56; strong sheets, £68; India sheets, £66 10s.; yellow metal, 6 $\frac{1}{4}$ @6 $\frac{3}{4}$ d.

Imports of copper into the United States for the 8 months ending August 31, with re-exports of foreign material, are reported by the Bureau of Statistics, as below, in long tons of 2,240 lbs.:

	1901.	1902.	Changes.
Ore and matte:			
Imports	57,008	55,029	D. 1,979
Re-exports	6,693	10,104	I. 3,411
Net imports	50,315	44,925	D. 5,390
Pigs, bars, etc.:			
Imports	21,681	21,556	D. 125
Re-exports	4,321	3,518	D. 803
Net imports	17,360	18,038	I. 678

The reports of the bureau do not separate ore and matte, so that the copper contents cannot be estimated closely. An approximate estimate, however, puts the total amount of fine copper included in the net imports at 40,500 tons this year, against 42,500 tons last year. Of the ore and matte imported this year, 20,709 tons was from Mexico, and 27,708 tons from Canada. Of the fine copper imported this year 11,617 tons came from Mexico, and 8,952 tons from Great Britain.

Copper exports from Atlantic ports in the week ending October 1 are reported by our special correspondents as follows: Great Britain, 619 tons; Germany, 765; Holland, 808; Italy, 110; France, 1,064; Austria, 445; Belgium, 50; Turkey, 50; Japan, 5; Panama, 33; total, 2,949 tons. Imports of copper were 701 tons from Great Britain, 55 tons from France and 562 tons from Mexico; total, 1,318 tons.

Exports of domestic material for the 8 months are reported by the Bureau of Statistics as follows, in long tons:

	1901.	1902.	Changes.
Ore and matte	9,793	13,407	I. 3,614
Fine copper	59,896	114,375	I. 54,479

Mr. John Stanton's statement, recently published, estimates the total exports reduced to tons of fine copper at 122,128 long tons, against 61,691 tons last year.

Tin.—After a short spurt at the beginning of the week, caused by higher London quotations and a somewhat better consumptive inquiry here, the market settled back into dullness. At the close we quote spot, 25 $\frac{3}{4}$ c.; October, 25 $\frac{1}{4}$ c.; November, 25 $\frac{1}{4}$ c., and December, 25c.

The foreign market, which closed last week at £118 5s., opened on Monday at £118 10s., but commenced to decline on Wednesday, and the closing quotations on Thursday are cabled as £115@£115 2s. 6d. for spot and £113 10s. @£113 12s. 6d. for three months prompt.

Statistics for the month of September show an increase in the visible supplies of 2,600 tons.

Imports of tin into the United States for the 8 months ending August 31 are reported as below, in long tons:

	1901.	1902.	Changes.
Straits	12,635	14,410	I. 1,775
Australia	332	150	D. 182
London	8,771	10,237	I. 1,466
Holland	849	892	I. 43
Other countries	122	346	I. 224
Totals	22,709	26,035	I. 3,326

The total increase this year was 14.6 per cent. By far the larger part of the imports is Straits tin.

Exports of tin from the Straits Settlements for the 7 months ending July 31 are reported as below, in long tons of 2,240 lbs.:

	1901.	1902.	Changes.
United States	12,017	11,842	D. 175
Great Britain	13,146	13,727	I. 581
European Continent	3,421	4,369	I. 948
China and India	1,642	928	D. 714
Totals	30,226	30,866	I. 640

The increase was mainly in shipments to Great Britain and Holland. Direct shipments to the United States showed a small decrease.

Visible stocks of tin on October 1 are reported as below, in long tons of 2,240 lbs.:

	Store.	Afloat.	Totals.
London	4,583	4,255	8,838
Holland	2,657	425	3,082
U. S., exc. Pacific ports	3,671	2,634	6,305
Totals	10,711	7,314	18,025

This shows an increase of 414 tons, as compared with October 1, 1900.

Lead is quiet but steady, without any special feature. The ruling quotations are unchanged at 4@4.05c., St. Louis, and 4.05@4.10c. New York.

The foreign market is steady, Spanish lead being quoted £10 15s.@£10 16s. 3d., and English lead 5s. higher.

Imports of lead into the United States for the 8 months ending August 31, with re-exports of imported lead, are given by the Bureau of Statistics of the Treasury Department as below, in short tons of 2,000 lbs.:

	1901.	1902.	Changes.
Lead, metallic	133	2,175	I. 2,042
Lead in ore and base bullion	80,325	66,927	D. 13,398
Total imports	80,458	69,102	D. 11,356
Re-exports	69,865	55,789	D. 14,076
Balance	10,593	13,313	I. 2,720

Of the imports this year, 60,369 tons, or 87.5 per cent, were from Mexico, and 6,093 tons, or 8.8 per cent, from Canada. In addition to the re-exports given above, there were 3,182 tons of domestic lead exported, against 2,361 tons last year; an increase of 821 tons.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is firm

but quiet. Missouri brands are quoted at 4@4.02 $\frac{1}{2}$ c.; desilverized lead brings 4.05c.

Spelter continues in fair demand, with prices steady at about 5.20@5.25c., St. Louis, and 5.45@5.50c., New York.

The foreign market is somewhat firmer, good ordinaries being quoted £19 2s. 6d., and specials 5s. higher.

Exports of spelter or metallic zinc from the United States for the 8 months ending August 31 were 2,957 short tons, against 2,518 tons for the corresponding period in 1901; an increase of 439 tons. Exports of zinc ore were 29,270 tons, against 26,098 tons last year; an increase of 3,172 tons.

St. Louis Spelter Market.—The John Wahl Commission Company telegraphs us as follows: Spelter is 5.25c. nominally. Demand is light. Holders are still firm in their views, and appear to be unwilling to make concessions which are being demanded by the consuming fraternity, the latter considering prices too high.

Antimony is without any change. We quote 9 $\frac{1}{2}$ @9 $\frac{3}{4}$ c. for Cookson's; 7 $\frac{3}{4}$ @7 $\frac{3}{4}$ c. for Hallett's; 7 $\frac{1}{4}$ @7 $\frac{1}{4}$ c. for Hungarian, Japanese, Italian and United States Star.

Imports of antimony into the United States for the 8 months ending August 31 are reported as below, in pounds:

	1901.	1902.	Changes.
Metal and regulus	2,629,131	3,601,143	I. 972,012
Antimony ore	1,601,539	418,723	D. 1,182,816

This shows a large increase in metal imports, with a heavy decrease in the ore imported.

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

Exports of nickel, nickel oxide and nickel matte from the United States for the 8 months ending August 31 are reported at 1,993,411 lbs., against 3,855,244 lbs. in the corresponding period in 1901; a decrease of 1,861,833 lbs. this year.

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

Chemical ware (crucibles and dishes), best hammered metal from store in large quantities, is worth 73 $\frac{1}{2}$ c. per gram.

Imports of platinum into the United States for the 8 months ending August 31 were 5,077 lbs., against 4,383 lbs. in the corresponding period in 1901; an increase of 694 lbs. this year.

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

Exports of quicksilver from all United States ports for the 8 months ending August 31 were 585,176 lbs., against 515,760 lbs. for the corresponding period in 1901; an increase of 69,416 lbs. this year.

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-Tungsten (37%)...28c.
No. 2, 90% ingots	31@34c.	Magnesium.....\$2.75
Rolled Sheets	4c.	Manganese, pure (N.Y.)...60c.
Alum-bronze	20@23c.	Mangan'e Cop. (20% Mn)...32c.
Nickel-alum	33@39c.	Mangan'e Cop. (30% Mn)...38c.
Bismuth	\$1.50	Molybdenum (Best)...\$1.82
Chromium, pure (N.Y.)	80c.	Phosphorous.....50c.
Copper, red oxide	50c.	American.....70c.
Ferro-Molyb'dum (50%)	\$1.25	Sodium metal.....50c.
Ferro-Titanium (10%)	90c.	Tungsten (Best).....62c.
Ferro-Titanium (20@25%, N. Y.)	55c.	

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

Average Prices of Metals per lb., New York.

Month.	Tin.		Lead.		Spelter.	
	1902.	1901.	1902.	1901.	1902.	1901.
January	23.54	26.51	4.000	4.850	4.27	4.13
February	24.07	26.08	4.075	4.350	4.15	4.01
March	26.32	26.08	4.075	4.350	4.28	3.91
April	27.77	25.93	4.075	4.350	4.37	3.99
May	29.85	27.12	4.075	4.350	4.47	4.04
June	29.36	28.60	4.075	4.350	4.96	3.99
July	28.38	27.85	4.075	4.350	5.27	3.95
August	28.23	26.78	4.075	4.350	5.44	3.90
September	26.60	25.31	4.075	4.350	5.49	4.08
October		26.62		4.350		4.23
November		26.67		4.350		4.30
December		24.36		4.153		4.31
Year	26.54		4.394		4.09	

Average Prices of Copper.

Table with columns: Month, Electrolytic, New York, Lake, London Standard, 1902, 1901. Rows: January to December, Year.

New York prices are in cents, per pound; London prices in pounds sterling, per long ton of 2,240 lbs., standard copper.

Average Prices of Silver, per ounce Troy.

Table with columns: Month, London, N.Y., 1902, 1901, Y.Y. Rows: January to December, Year.

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

DIVIDENDS.

Table with columns: Name of Company, Date, Share, Total, Per, Total to Date. Rows: Am. Sm. & Ref., Bunker Hill & Sull., Central Coal & Coke, etc.

ASSESSMENTS.

Table with columns: Name of Company, Location No., Delinq., Sale, Amt. Rows: Alta, American, Andes, Belcher, Berkeley Crude Oil, etc.

STOCK QUOTATIONS.

NEW YORK.

Table with columns: Company and Location, par, Sept. 25, Sept. 26, Sept. 27, Sept. 28, Sept. 29, Sept. 30, Oct. 1, Sales. Rows: Amalgamated, Anaconda, Argenta, etc.

†Assessment Paid.

Coal, Iron and Industrial Stocks.

Table with columns: Am. Agr. Chem., U.S., Am. Agr. Chem. pf. U.S., Am. Sm. & Ref. U.S., etc. Rows: Am. Agr. Chem., U.S., Am. Agr. Chem. pf. U.S., etc.

Total sales, 629,859 shares. † Ex-Dividend.

BOSTON, MASS.*

Table with columns: Name of Company, par, Shares listed, Sept. 25, Sept. 26, Sept. 27, Sept. 28, Sept. 29, Sept. 30, Oct. 1, Sales. Rows: Adventure Con., Allouez, Amalgamated, Am. Z. L. & Sm., etc.

Total sales, 72,160 shares.

PHILADELPHIA, PA. †

Table with columns: Name and Location of Company, par, Sept. 25, Sept. 26, Sept. 27, Sept. 28, Sept. 29, Sept. 30, Oct. 1, Sales. Rows: Am. Alkali, Cambria Iron, Cambria Steel, etc.

†Reported by Townsend, Whelen & Co., 300 Walnut St., Philadelphia, Pa. Total sales 17,494 shares.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.*

Table of stock quotations for Colorado Springs, Colo. listing companies like Acacia, Alamo, Am. Con., Anaconda, Ben Hur, Black Bell, Blue Bell, C. K. & N., C. C. & N., Dante, Dr. Jack Pot, Elton Con., El Paso, Fanny Rawlings, Findley, Gold Bond, Gold Dollar Con., Golden Cycle, Golden Fleece, Gold Sovereign, Iron Clad, Isabella, Jack Pot, Last Dollar, Lexington, Little Puck, Moll Gibson, Moon Anchor, Morning Star, National, Nellie V., New Haven, Pappoose, Pharmacist, Pinnacle, Pointer, Portland, Prince Albert, Republic, Rose Maud, Sunset Eclipse, Uncle Sam, Windicator Con, and Work.

*Colo. Springs Mining Stock Exchange. All mines are in Colorado. Total sales 334,801 shares.

Colorado Springs (By Telegraph.)

Table of telegraphed stock quotations for Colorado Springs, listing companies like Acacia, Alamo, Anaconda, Cripple Creek Con., Doctor Jack Pot, Elton Con., El Paso, Fanny Rawlings, Gold Dollar Con., Golden Fleece, Isabella, Jack Pot, Last Dollar, Moll Gibson, Moon Anchor, Pharmacist, Portland, and Work.

MEXICO.

Sept. 20.

Table of stock quotations for Mexico, listing companies like Burango, Ca. Min. de Penoles, Guanajuato, Guanajuato, Cinco Senores y An., aviadora, Providencia San Juan de la Luz, Guerrero, Garduno y Anexas, Hidalgo, Amistad y Concordia, Carmen, aviadora, Ca. Real del Monte, El Encino, aviadora, Guadalupe Fresnillo y Anexas, La Blanca, aviadora, La Blanca, aviadora, Maravillas y An., aviadador, Maravillas el Lobo, Palma y An., aviadador, Sta. Gertrudis y An., aviadadora, Santo Tomas Apostol aviadador, San Rafael y An., Trompillo, San Rafael y An., aviadador, Sorpresa, aviadadora.

ST. LOUIS, MO.* Sept. 27.

TORONTO, ONT. Sept. 29

Table of stock quotations for St. Louis, Mo. and Toronto, Ont., listing companies like Am.-Nettie, Colo., Asherine Lead, Mt. Central Coal & C., Central C. & C., Central Lead, Mo., Columbia Lead, Mo., Con. Coal, Ill., Doe Run Lead Co., Granite Bimet, Mt., St. Joe Lead, Mo., Center Star, Fairview, Lone Pine, Mt. Lion, North Star, Rambler-Cariboo, Republic, War Eagle Con, White Bear, Winnipeg, Develop. Co., and Can. G. F. S.

*From our Special Correspondent.

Total sales, 8,000 shares. † Ex-Dividend

LONDON.

Sept. 20.

Table of stock quotations for London, listing companies like Anaconda, Copiapo, De Lamar, Enterprise, El Oro, Frontino & Bolivia, Hall Mr. & Sm., Le Roi, Le Roi No. 2, Montana, Straton's Independence, St. John del Rey, Utah Con., Ymir, Linares, Mason & Barry, Rio Tinto, Tharsis, Australia and New Zealand, Broken Hill, Great Boulder, Ivanhoe, Kalkurle, Lake View, Mt. Lyell, Mt. Morgan, Waihi, Mysore Gold, Nundydroog, Ooregum, Cape Copper, Crown Reef, De Beers, Ferreira, Goldenhuis, Henry Nourse, Jagersfontein, John'n'g Con. Invest., Jubilee, Langlaagte Est., Meyer & Clariton, Namaqua, Primrose, Rand Mines, Robinson, Sheba, and Wolhuter.

c.—Copper. d.—Diamonds. g.—Gold. l.—Lead. s.—Silver.

PARIS.

Sept. 11.

Table of stock quotations for Paris, listing companies like Acieries de Creusot, Firminy, ia Marine, Anzin, Boleo, Brianks, Champ d'Or, Courrieres, Dynamite Centrale, Escombrera-Bleyberg, Fraser River, Huanchaca, Laurium, Malfidano, Metanux, Moka-el-Hadid, Napthe Baku, Napthe Nobel, Nickel, Penarroya, Rebecca, Salines de l'Est, Salines du Midi, and Vielle Montagne.

SALT LAKE CITY* Sept. 27.

SPOKANE, WASH.* Sept. 26.

Table of stock quotations for Salt Lake City and Spokane, Wash., listing companies like Ajax, Ben Butler, Bullion-Beck, California, Carisa, Century, Con. Mercuer, Daly-Judge, Daly-West, Eagle & B. Bell, Grand Central, L. Mammoth, Mammoth, May Day, Ontario, Sacramento, Star Con., So. Swansea, Swansea, Uncle Sam, Victor, West Mr. Glory, and Yankee Con.

All mines are in Utah. *By our Special Correspondent. Total sales, 188,835 shares.

Total sales 65,900 shares. *Reported by Hunner & Harris.

DIVIDENDS.

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

COAL, IRON AND INDUSTRIALS.

Table listing dividends for Gold, Silver, Copper, Lead, Quicksilver, and Zinc companies. Columns include Name and Location of Company, Authorized Capital Stock, Shares (Issued, Par Val), Dividends (Paid 1902, Total to Date, Latest), and Amt.

Table listing dividends for Coal, Iron, and Industrial companies. Columns include Name and Location of Company, Authorized Capital Stock, Shares (Issued, Par Val), Dividends (Paid 1902, Total to Date, Latest), and Amt.

CANADA, CENTRAL AND SOUTH AMERICA. MEXICO.

Table listing dividends for companies in Canada, Central and South America, and Mexico. Columns include Name and Location of Company, Authorized Capital Stock, Shares (Issued, Par Val), Dividends (Paid 1902, Total to Date, Latest), and Amt.

CHEMICALS, MINERALS, RARE EARTHS, ETC.—CURRENT WHOLESALE PRICES.
(See also Market Reviews.)

Abrasive—			Barium—			Graphite—Am. f.o.b. Provi-			Paints and Colors—		
Cust. Meas.	Price.		Cust. Meas.	Price		Cust. Meas.	Price		Cust. Meas.	Price	
Carborundum, f.o.b. Niagara Falls, Powd., F. F. F. F. lb.	\$0.08		Oxide, Am. hyd. cryst. lb.	\$0.02½		dence, R. I. lump. sh. ton	\$8.00		Metallic, brown sh. ton	\$19.00	
Grains.....	.10		Sulphate (Blanc Fixe).....	.02		Pulverized.....	30.00		Red.....	16.16	
Corundum, N. C.....	.07@.10		Barytes—			German, com. pulv..... lb.	.01¼@.01½		Ocher, Am. common.....	9.25@10.00	
Chester, Mass.....	.04½@.05		Am. Crude, No. 1..... sh. ton	9.00		Best pulverized.....	.01¼@.02		Best.....	21.25@23.00	
Barry's Bay, Ont.....	.07¼@.09¼		Crude, No. 2.....	8.00		Ceylon, common pulv.....	.02¼@.03¼		Dutch, washed..... lb.	.04¾	
Crushed Steel f.o.b. Pittsburg.....	.05¼		Crude, No. 3.....	7.75		Best pulverized.....	.04@.08		French, washed.....	.01¼@.01¾	
Emery, Turkish flour, in kegs.....	.03¼		German, gray.....	14.50		Italian, pulv.....	.01¾		Orange mineral, Am.....	.07¼@.08	
Grains, in kegs.....	.05@.05½		Snow white.....	17.00		Gypsum—Ground..... sh. ton	8.00@8.50		Foreign, as to make.....	.08¼@.11¼	
Naxos flour, in kegs.....	.03¼		Bauxite—Ga. or Ala. mines:			Fertilizer.....	7.00		Paris green, pure, bulk.....	.12	
Grains, in kegs.....	.05@.05½		First grade..... lg. ton	5.50		Rock..... lg. ton	4.00		Red lead, American.....	.05¼@.06	
Chester flour, in kegs.....	.03¼		Second grade.....	4.75		English and French.....	14.00@16.00		Foreign.....	.04¾@.08	
Grains, in kegs.....	.05@.05½		Bismuth—Subnitrate..... lb.	1.40		Infusorial Earth—Ground.			Turpentine, spirits..... gal.	.49¼@.49¾	
Peekskill, f.o.b. Easton, Pa., flour, in kegs.....	.01¼		Subcarbonate.....	1.85		American, best.....	20.00		White lead, Am., dry..... lb.	.04¼@.04¾	
Grains, in kegs.....	.02¼		Bitumen—"B"..... "	.03¼		French.....	37.50		American, in oil.....	.05¼@.05¾	
Crude, ex-ship N. Y.: Abbott (Turkey)..... lg. ton	23.50@30.00		"A".....	.05		German.....	40.00		Foreign, in oil.....	.67¾@.09¼	
Kuluk (Turkey).....	22.00@24.00		Bone Ash..... "	.02¼@.02½		Iodine—Crude..... 100 lbs	2.45		Zinc, white, Am., ex dry.....	.04¾@.04¾	
Naxos (Greek) h. gr.....	26.00		Borax..... "	.07¼@.07½		Nitrate, com'l.....	.05		American, red seal.....	.06¼	
Garnet, as per quality..... sh. ton	25.00@35.00		Sulphate..... 100 lbs.	2.00@2.50		True.....	.04		Green seal.....	.07	
Fumic Stone, Am. powd..... lb.	.01¾@.02		Acetate, gray.....	1.30		Oxide, pure copperas color.....	.05@.10		Foreign, red seal, dry.....	.05¼@.06¼	
Italian, powdered.....	.01½		" brown.....	.90		Purple-brown.....	.02		Green seal, dry.....	.06¼@.06¾	
Lump, per quality.....	.04@.40		Carbide, ton lots f.o.b. Niagara Falls, N. Y., for Jersey City, N. J..... sh. ton	70.00		Venetian red.....	.01@.01¼				
Rotenstone, ground.....	.02¼@.04¼		Chloride, ppt..... lb.	.05		Scale.....	.01@.03		Potash—		
Lump, per quality.....	.06@.20		Chloride, 100 lbs.....	.75@.90		Kaolin—(See China Clay.)			Caustic, ordinary.....	.04¾@.05	
Bouge, per quality.....	.10@.30		Cement—			Kryolith—(See Cryolite.)			Elect. (90%).....	.06¼	
Best Emery, f.o.b. Pittsburg.....	.07		Portland, Am., 400 lbs..... bbl.	1.70@1.90		Lead—Acetate, white..... "	.07¼@.08				
			Foreign.....	1.65@2.25		Brown.....	.06		Potassium—		
			"Rosendale," 300 lbs.....	.75		Nitrate, com'l.....	.06¼		Bicarbonate, cryst.....	.09¼	
			Slag cement, imported.....	1.65		" gran.....	.08¼		Powdered or gran.....	.14	
			Ceresine—			Lime—Com. abt. 250 lbs..... bbl.	.80		Bichromate, Am.....	.08¼@.09¼	
			Orange and Yellow..... lb.	.12		Finishing.....	.90		Scotch.....	.08¼@.09	
			White.....	.13½		Magnesite Greece.			Carbonate.....	.03¼@.03¼	
			Chalk—Lump, bulk..... sh. ton	2.50		Crude (95%)..... lg. ton	6.00@6.50		Chromate.....	.35	
			Ppt. per quality..... lb.	.03¼@.06		Calcined..... sh. ton	17.50@18.00		Cyanide (98@99%).....	.23	
			Chlorine—Liquid..... "	.80		Bricks..... M	170.00		Kaimit..... lg. ton	9.05	
			Water.....	.10		Am. Bricks, f.o.b. Pittsburg.....	175.00		Manure salt, 20%..... 100 lbs.	.66	
			Chrome Ore—			Magnesium—			Double Manure salt, 48@53.....	1.12	
			(50% ch.) ex-ship N. Y..... lg. ton	24.75		Carbonate, light, fine sd..... lb.	.05		Muriate, 80@85%.....	1.83	
			Bricks, f.o.b. Pittsburg..... M	175.00		Blocks.....	.07@.09		95%.....	1.86	
			Clay, China—Am. com., ex-dock, N. Y..... lg. ton	8.00		Chloride, com'l.....	.01¼		Pernanganate..... lb.	.09¼@.10	
			Am. best, ex-dock, N. Y.....	9.00		Fused.....	.20		Prussiate, yellow.....	.13¾@.14	
			English, common.....	12.00		Nitrate.....	.60		Red.....	.36	
			Best grade.....	17.00		Sulphate..... 100 lbs.	.75@.95		Sulphate, 90%..... 100 lbs.	2.11	
			Fire Clay, ordinary..... sh. ton	4.25		Manganese—Powdered.			96%.....	2.14	
			Best.....	6.00		70@75% binoxide..... lb.	.01¼@.01¾		Sylvinit..... unit	.39¼	
			Slip Clay.....	5.00		Crude, pow'd.....			Quartz—(See Silica.)		
			Coal Tar Pitch..... gal.	.08		75@85% binoxide.....	.01¼@.02¼		Salt—N. Y. com. fine..... sh. ton	2.00	
			Cobalt—Carbonate..... lb.	1.75		85@90% binoxide.....	.02¼@.03¼		N. Y. agricultural.....	1.50	
			Oxide—Black.....	2.26@2.30		90@95% binoxide.....	.03¼@.05¼		Saltpetre—Crude..... 100 lbs.	3.20@3.40	
			Gray.....	2.28@2.40		Carbonate.....	.16@.20		Refined.....	4.25@4.62¼	
			Smalt, blue ordinary.....	.06		Chloride.....	.04		Silica—Best foreign..... lg. ton	10.00@11.00	
			Best.....	.20		Ore, 50%, Foreign..... unit	.14@.19		Ground quartz, ord..... sh. ton	6.00@8.00	
			Copperas—in bulk..... 100 lbs.	.37¼		Domestic.....	.30		Best.....	12.00@13.00	
			in bbls.....	.42¼		Mercury—Bichloride..... lb.	.77		Lump quartz.....	2.50@4.00	
			Copper—Carbonate..... lb.	.18@.19		Mica—N. Y. gr'nd, coarse..... sh. ton	33.00@38.00		Glass sand.....	2.75	
			Chloride.....	.25		Fine..... lb.	.07@.02		Silver—Chloride..... oz.	.65	
			Nitrate, crystals.....	.35		Sheets, N. C., 2x4 in.....	.30		Nitrate.....	.35	
			Oxide, com'l.....	.19		3x3 in.....	.80		Oxide.....	.85@1.10	
			Cryolite..... "	.06¼		3x4 in.....	1.50		Sodium—		
			Explosives—			4x4 in.....	2.00		Bichromate..... lb.	.06¼	
			Blasting powder, A..... 25 lb. keg	.65		6x6 in.....	3.00		Chlorate, com'l.....	.07¼@.08	
			Blasting powder, B.....	1.40		Mineral Wool—			Hyposulphite, Am..... 100 lbs.	1.60@1.65	
			"Rackarock," A..... lb.	.25		Slag, ordinary..... sh. ton	19.00		Peroxide..... lb.	1.70@1.90	
			"Rackarock," B.....	.20		Selected.....	25.00		Phosphate.....	.45	
			Judson R. R. powder.....	.10		Rock, ordinary.....	32.00		Phosphate.....	.02¼	
			Dynamite (20% nitro-glycerine).....	.13		Selected.....	40.00		Prussiate.....	.11@.11¼	
			(30% nitro-glycerine).....	.14		Nickel—Oxide, No. 1..... lb.	1.00		Silicate, conc.....	.05	
			(40% nitro-glycerine).....	.15		No. 2.....	.60		Com'l.....	.01	
			(50% nitro-glycerine).....	.16¼		Sulphate.....	.20@.21		Sulphate, com'l..... 100 lb.	75@82¼	
			(60% nitro-glycerine).....	.18		Oils—Black, reduced 29 gr.:			Sulphide..... lb.	.01¼	
			(75% nitro-glycerine).....	.21		25@31, cold test..... gal.	.09¼@.13¼		Sulphite crystals.....	.02¼	
			Glycerine for nitro (32 2-10° Be.).....	.13¾@.13¾		15, cold test.....	.10¼@.11¼		Sulphur—Roll..... 100 lbs.	1.85	
			Feldspar—Ground..... sh. ton	8.00@9.00		Zero.....	.11¼@.12¼		Flour.....	1.90	
			Flint Pebbles—Danish, Best..... lg. ton	14.75		Summer.....	.09¼@.09¼		Flowers, sublimed.....	2.15	
			French, Best.....	11.75		Cylinder, dark steam ref.....	.08¼@.10¼		Tale—N. C., 1st grade..... sh. ton	13.75	
			Fluorspar—			Dark, filtered.....	.11¼@.15¼		N. Y., Fibrous, best.....	10.20	
			Am. lump, 1st grade..... sh. ton	\$14.40		Light filtered.....	.14¼@.17¼		French, best..... 100 lbs.	1.25	
			2d grade.....	13.90		Extra cold test.....	.21¼@.26¼		Italian, best.....	1.62¼	
			Gravel and crushed, 1st gr.....	13.40		Gasoline, 86°@90°.....	.15@.20		Tar—Regular..... bbl.	2.30	
			2d grade.....	12.40		Naphtha, crude, 68°@72°..... bbl.	9.05		Oil barrels.....	2.40	
			Ground, 1st grade.....	17.90		"Stove"..... gal.	.12		Tin—Crystals..... lb.	.22	
			2d grade.....	16.50		Linseed, domestic raw.....	.52@.55		Oxide.....	.45	
			Foreign, lump.....	8.00@12.00		Boiled.....	.57		Uranium—Oxide.....	2.25@3.00	
			Ground.....	11.50@14.00		Calcutta, raw.....	.75		Zinc—Metallic, ch. pure.....	.07@.07¼	
			Fuller's Earth—Lump..... 100 lbs.	.75		Ozokerite..... lb.	.11¼		Carbonate, ppt.....	.03	
			Powdered.....	.80		Paints and Colors—			Chloride solution, com'l.....	.02¼	
						Chrome green, common.....	.05		" granular.....	.41¼@.04¾	
						Pure.....	.16		Dust.....	.04¼@.04¾	
						Yellow, common.....	.10¼		Sulphate.....	.02¼@.02¼	
						Best.....	.25				
						Lampblack, com'l.....	.04¼				
						Refined.....	.07				
						Litharge, Am. powd.....	.04¼@.05¼				
						English flake.....	.06¼@.08¼				
						Glassmakers'.....	.07¼@.08				

THE RARE EARTHS.

	Cust. Meas.	Price
Boron—Nitrate.....	lb.	\$1.50
Calcium—Tungstate (Scheelite).....	"	.60
Cerium—Nitrate.....	"	10.00
Didymium—Nitrate.....	"	35.00
Erbium—Nitrate.....	"	40.00
Glucinum—Nitrate.....	"	20.00
Lanthanum—Nitrate.....	"	30.00
Lithium—Nitrate.....	oz.	.60
Strontium—Nitrate.....	lb.	.07½@.07
Thorium—Nitrate 49@50%.....	"	4.50
Uranium—Nitrate.....	oz.	.25
Yttrium—Nitrate.....	lb.	40.00
Zirconium—Nitrate.....	"	8.00

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