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German iron production has shown a considerable increase thus far this year, but has apparently outrun the demand, since several districts have voted to restrict production by 25 per cent. for the balance of the year. In finished iron the Rhenish-Westphalian syndicate reports business and prices steady, with some increase in demand, especially for export. In the Silesian district, however, reports are less favorable, and there is some complaint of light orders, especially for rails and other railroad material. Some Russian orders have helped matters in this district also, and more are hoped for later in the year.

The growth of the exports is largely due to the development of the trade with Russia under the new treaty. It is interesting to note that the slag from the Thomas-Gilchrist process is becoming an article of commerce of some importance. It is used in the manufacture of fertilizers for the phosphoric acid which it contains.

German imports and exports of iron and steel for the six months ending June 30th are reported by "Stahl und Eisen" as below, in metric tons:

	Imports.		Exports.	
	1893.	1894.	1893.	1894.
Pig iron.....	106,772	86,182	50,301	81,287
Manufactured iron and steel.....	51,120	55,085	592,090	680,229
Totals.....	157,892	141,567	642,391	761,516
Iron ores.....	681,245	857,108	1,189,235	1,243,447
Thomas slag.....	32,388	40,262	21,401	32,157

This year's meeting of the British Association for the Advancement of Science, which was held at Oxford, August 9th to 16th, was marked by the important announcement by Lord Rayleigh and Professor Ramsay that they have discovered a new constituent of the atmosphere, a description of which appears in another column. This new constituent is a gas more inert than nitrogen, and existing in the air to the extent of less than 1 per cent. of the total. The discoverers purposely gave very few details, because their experiments are as yet in an incomplete state. They do not say whether they consider it a new element or simply a hitherto known or unknown compound, but no doubt in the course of a few months a complete treatise on the subject will be presented to one of the societies.

It may be here remarked that the British Association is essentially an amateur and dilettante gathering. As a rule, the papers read and the lectures delivered do not contain anything very novel, but the gathering has often been made the occasion of the announcement of some great fundamental discovery.

It has for some time been known that nitrogen prepared from the atmosphere is of slightly higher density than that produced in any other way. Lord Rayleigh therefore submitted a volume of air mixed with an excess of oxygen to the action of the continuous electric spark. The nitrous gases were absorbed by potash as soon as produced, and when no more were formed the excess of oxygen was absorbed by pyrogallol. As the experiment proceeded the density of the supposed nitrogen was found to increase gradually, until at the end of the experiment it stood at 1.009. No characteristic reactions of this remainder are given, but it is stated that it is more inert than nitrogen and that it has a different spectrum.

Prof. James Dewar, the English authority on the liquefaction of gases, states that he has always found in liquefying air that there is about 1 per cent. of white solid formed. Some portions of this solid have usually turned out to be nitrous oxide, carbonic acid and some other unknown impurity, which he always thought was introduced to the air in its passage through the compressors. No doubt after Lord Rayleigh's announcement, Professor Dewar will investigate this white solid from a different point of view.

THE AMERICANS DO IT BETTER.

A correspondent of a South African paper writes to it as follows:

Many of the English engineering firms are complaining of large amount of support given to American firms. It is not that the American machinery is better than English. The fact is the American firms do things better than the English. When they send good machinery here they send good men to erect it, and see it put on good foundations, whereas English machinery is left to the mercy of anybody to erect. I can name a place where a large English plant has been fixed by one wagon-maker, one sailor, one handyman, and one boiler-maker's laborer. They have put a large air-compressor on a rough stone foundation, wedged up with small pieces of iron. Such work is a disgrace to British manufacture.

This is a flattering testimonial as to the methods of American manufacturers, and conveys a useful hint to them in their foreign trade.

CHEMISTRY IN THE FOUNDRY.

The discussion which has arisen regarding the value of chemical work in an iron foundry is of much interest, inasmuch as it is following the same lines that were advanced when the desirability of a chemist at blast furnaces and mills was being considered. At that time the older furnace-men believed that the only way in which ores, fuel or flux could be tested with any degree of accuracy was to put them to trial. The reason for this was not so much in their natural objection to new methods, but because the great majority of them were unable, through lack of knowledge,

to properly apply the figures given them. Further than this, as the application of chemistry in practical detail to furnace work was new, there was comparatively little but experimental or theoretical data to guide the chemist or ironmaster, and each had to apply it as judgment dictated. In each specific instance its application had to be learned by experience.

In many cases the early work resulted in the discomfiture of the chemist and disgust of the ironmaster. A burden calculated to give a predetermined cinder would, for some apparently inexplicable reason, give results so widely different as to make the "theoretical" furnaceman an object of ridicule before the men and of grave concern to his employers.

But by degrees the real service which chemistry could do became known. The comparison of results and more careful study of conditions, together with technical papers and discussions upon the subject, gave more data, and slowly, but very surely, chemical work has come to be recognized as essential to proper furnace conduct as any other part of the business.

With the iron founders the same process of evolution is taking place, and it is a pleasure to note that it is progressing rapidly. A very few years ago the suggestion that a knowledge of chemistry would improve foundry practice was received with pitying ridicule, but the experiments made by Keep, Turner and others, as well as the extending use of high silicon irons as softeners, started a turn of sentiment that is, as we have said, steadily growing. The early trial, like those in furnace practice, resulted poorly. The founder had a good casting of certain composition and wanted a mixture which would give it, but when he put in a charge proportioned for this purpose the result was altogether different.

While knowledge on the subject has been increased vastly there is not even yet sufficient data to do this. Many things must be learned, and these will be known only after repeated trials and study.

One trouble has been that founders and others will not recognize that a knowledge of the chemical or physical features of either pig iron or the castings is not sufficient. The work done by the founder in blowing his furnace, in the manner of charging, of tapping, and the many other small details of operating has much to do with the results. Neither the chemist alone nor the founder can bring about the best work; it requires both in one, the chemical knowledge combined with the practical ability, and this latter is the result only of experience. Every metallurgical operation now being conducted proves this assertion, and it is not likely that iron founding is the single exception.

PROPOSED MINING LEGISLATION.

The adjournment of Congress leaves several bills in the hands of the committees on mines and mining of the two houses, concerning all of which it is highly to be desired that they may never be heard of more. Since the schemes they represent, however, may come to the surface again in future sessions, it may be well to call attention to them now.

1. House Bill No. 6,169, introduced and referred March 8th, is entitled "A bill to authorize the location and working of mines of precious metals, belonging to the United States, situated in Spanish or Mexican land grants." The first section provides:

"That whenever any gold, silver, or quicksilver mines, or other valuable mineral deposits belonging to the United States and situated within the exterior boundaries of any tract of land held, claimed, allowed, confirmed, or patented by the United States to or by any person or persons under and in pursuance of an act entitled 'An act to establish a court of private claims, and to provide for the settlement of private land claims in certain States and Territories,' approved March third, eighteen hundred and ninety-one, are hereby declared to be free and open to location, working, and purchase by citizens of the United States and those who have declared their intention to become such, in the same manner and subject to the same laws and regulations as are or may be applicable to mineral deposits in lands belonging to the United States."

The second section provides that the owner of the land grant may recover damages at law for injury to the land occasioned by the miner, but cannot interfere with the mining itself if the miner gives a bond for damages; and the third section repeals all previous conflicting legislation.

The purpose of this bill is revolutionary and outrageous, reversing the settled land law of the country, as it was laid down many years ago in the Spanish land grant cases in California, and has been confirmed by decisions and practice ever since. If such legislation were now permissible, the next step would be to throw open all mines upon homestead and other agricultural tracts to free location, and thus to destroy all validity of the solemn deed of the United States.

But the bill is so clumsily drawn as to defeat its own purpose. It is evident, at a glance, that the second word, "whenever," makes nonsense of the first section which is not even a sentence. "Whenever" certain mines "are hereby declared," etc.—what then? Nothing.

Omitting this fatal word, however, we have still no effective enactment. For the mineral deposits designated are such as belong to the United States and are situated within tracts already deeded away by the United States. But it is long-established law that unless the patent contains an express reservation of mineral deposits, it conveys them absolutely. So there are, in fact, no such deposits as this bill professes to designate.

2. House Bill No. 8,028, introduced and referred August 28d, is entitled

"A bill to encourage deep mining in the United States." It provides that the Secretary of the Treasury shall pay to the Atlantic-Pacific Railway Tunnel Company \$100 per linear foot of its tunnel, not exceeding 26,000 ft. in all, upon the due completion thereof, the conditions being that the tunnel shall be at least 40 ft. high and 18 ft. wide, "and so constructed as to afford safe and ample space" for a double-track standard-gauge railway; and that the United States shall have "perpetual right for the free passage through said tunnel on all regular mail or passenger trains, or of the Government's special trains, or on freight trains," for mails, soldiers, employes, freight, etc.

There is little danger that this bill will ever become law. It is special legislation of the worst kind; and even as special legislation it offers nothing to the Government in return for the bounty received by its beneficiary. For the tunnel company is not bound to build any railway, and whoever should build a railway through the tunnel would not be bound to give the United States free transportation. The only thing promised is free passage through the tunnel. This Atlantic-Pacific tunnel, if I am not mistaken, is an old acquaintance, being the scheme fathered long ago by Mr. Brick Pomeroy, and not a particularly healthy infant up to date.

3. House Bill No. 7,171 (May 22d) and Senate Bill No. 1,823 (March 28th) are substantially alike. They are to amend Section 2324 of the Revised Statutes by suspending for the year 1894 the requirement of annual labor on mining claims held by possessory title on the public domain. This section was similarly suspended for 1893. I understand that neither of these bills has become a law; and there is, in my judgment, no reason to regret the fact. Such suspensions of wholesome regulations introduce endless confusion into the administration of what is, at best, a very imperfect system.

4. Senate Bill No. 1,431, to amend Section 2324 of the Revised Statutes, provides as an addition to that section that the Secretary of the Interior may designate any county as a separate mining district, and shall appoint a recorder therefor. I know of no special reason for such a law, or any purpose to be served by it, except the creation of new and unnecessary Federal officers. It is much better to let the records of mining titles, like those of other kinds of real estate, be cared for by officials elected by the people. If the United States assumes charge of this matter the next necessity will be a United States fireproof building in every county to hold the records.

5. Senate Bill No. 2,321 (August 22d) is entitled "A bill to authorize the exploration and purchase of mines within the boundaries of private land claims." It is even worse than House Bill No. 6,169, which I have characterized above, because it successfully expresses the spoliation it contemplates. By this bill "all valuable mineral deposits on lands not cultivated or improved, embraced within any land claim confirmed by decree of the Court of Private Land Claims, or as to which a suit for confirmation shall be pending in said court," are declared to be free and open to exploration and purchase. Prospectors have the right to enter and explore, and to make locations thereon; and if the owner will not accept the tender of \$2.50 per acre for such locations, they may be acquired by judicial condemnation, according to the local practice existing at the time for the condemnation of land for railroad purposes. It is not necessary to comment upon the audacious iniquity of this proposed measure.

R. W. RAYMOND.

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.

All letters should be addressed to the MANAGING EDITOR.

We do not hold ourselves responsible for the opinions expressed by correspondents.

The Cyanide Process.

EDITOR ENGINEERING AND MINING JOURNAL:
Sir: In your issue of June 9th you have published a highly instructive and interesting article on the cyanide process for the extraction of precious metals.

Although agreeing in the main with Mr. Walter H. Virgoe's views, I would ask your permission to indicate one or two matters on which our African experiences in gold extraction would appear to point to conclusions somewhat at variance with those arrived at by Mr. Virgoe.

Mr. Virgoe, in describing the nature of the material suitable for treatment by the cyanide process, names four points as essential:

1. He says that the ores to be treated "must be low-grade, because the higher the grade of the material the stronger the solution of cyanide must be, and the greater the loss of cyanide," and points out that 20% left in a \$25 ore means less loss of gold than 20% left in a \$100 ore. While granting that the treatment of high-grade ore, concentrates or tailings entails the use of comparatively strong solutions, and consequently increased loss of cyanide, I would suggest that higher grade material will generally bear a greater working cost. Further, our experience on the Witwatersrand is that whereas 80% is a good extraction from low grade tailings of say \$5, or so, we can treat concentrates running \$60 and upward to obtain a 90% to 95% extraction. As regards cost, I may mention that the Crown Reef G. M. company is treating its concentrates (from blankets) by cyanide, at a cost of about \$5.50 per ton.

2. The second desideratum in the material, i. e., fine state of division of the gold it contains, is quite in accordance with our experience on these fields. Coarse gold is undoubtedly one of the very greatest obstacles to rapid and successful cyanide treatment. At the same time it is a difficulty which does not usually occur with tailings from amalgama-

tion; and in the case of direct cyaniding of ores, the coarse gold might be advantageously caught by amalgamation or concentration subsequent to leaching in preference to unduly prolonging the leaching.

3. With respect to freedom from deleterious compounds: The presence of small quantities of copper minerals is not found to interfere seriously with the economical and successful cyaniding of tailings in this country. Further, the presence of ferrous and ferric sulphates, basic sulphates, etc., presents a difficulty which is by no means insuperable, and it can be overcome by a more or less careful preliminary washing and treatment with alkali or lime (as Mr. Virgoe himself mentions) and adds at most say 25c. per ton to the cost of the process. I would mention that instead of using limewater for neutralizing "acidity" we prefer to secure as intimate a mixture as possible of powdered lime with the "acid" tailings to be treated.

4. Regarding the leaching properties of the ore or trailings to be treated, I am quite in accord with Mr. Virgoe, for badly percolating material (such as battery slimes) is quite the greatest bugbear of the "cyanide man."

Coming to the question of the various sources of loss of cyanide, the amount of the chemical wasted in the zinc boxes is probably not so great as Mr. Virgoe seems to think. From some experiments tried in the laboratories of the African Gold Recovery Company, it appears that, by means of pure zinc-potassic cyanide (without admixture of free potassic cyanide) gold is dissolved from ores. Presumably, the zinc cyanide in the double salt is precipitated. Further, we have found that zinc cyanide, by treatment with sufficient alkali, resolves itself into the cyanide of the alkali and soluble zincate of the alkali. (If the alkali added be insufficient for this reaction we have, of course, the double cyanide of zinc and potassium formed.)

Mr. Virgoe can satisfy himself that all the cyanogen in the zinc-potassic cyanide can be combined with an alkali, and can be determined by the silver nitrate test, by simply rendering a solution of the double salt fairly, strongly alkaline, by addition of sodic or potassic hydrate.

In actual practice it is found that addition of alkali to working solutions which have become somewhat weak in alkali brings up the strength by regenerating, i. e., decomposing, the zinc cyanide. Potassic iodide being used as an indicator, this is not a fallacious result effected by the misleading action of free alkali on the silver nitrate test. So that, as a matter of fact, when our solutions are pretty strongly alkaline they contain no zinc as cyanide, but only as hydrate dissolved in alkali (zincate of potash, etc.). In consequence, I should prefer to err on the side of somewhat excessively long boxes and thorough precipitation rather than too limited a precipitating surface, and consequent pumping back into the tailings or ore of solutions assaying high in gold.

W. B. FELDTMANN.
JOHANNESBURG, S. A. R., July 27, 1894.

The Mineral Industry, Vol. II, 1893.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: The second volume of the "Mineral Industry" is to hand, and I have taken time from other duties to examine it closely. It is not a book that can be examined in a day or a week or a month and then laid aside, for it is full of most timely and valuable information. One is disposed to drop into the vernacular and say, "It is out of sight!" Such a compendium of useful knowledge for the capitalist, the engineer, the metallurgist, the merchant and the statesman has not heretofore appeared in the English language, nor, I dare say, in any language; and I beg to congratulate you upon the continuation of an enterprise at once so ambitious and so well executed. It seems to me that a better knowledge of what are the actual conditions of the mineral industry in other countries must lead to an expansion of our own commerce along lines closely identified with our own mineral wealth, such as the manufacture of mining machinery, transportation of minerals and appliances for treating them. It is in this particular that the publication of the "Mineral Industry" is so timely, for I note a fuller discussion of foreign affairs in this volume than appeared in Vol. I. One does not know what to admire most, the audacity of the conception or the success which has attended it. I am sure that you will go down to posterity (may the day be long postponed!) as the tutular divinity known and honored of all who go into the earth in search of rocks—an American Berg-geist!

Wm. B. PHILLIPS,
Mining Engineer and Metallurgist.
ENSLBY, Ala., June 27, 1894.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I beg to acknowledge receipt of Vol. II. of the "Mineral Industry." I considered Vol. I. the grandest statistical and reference work ever issued in the world's mining industry. But Vol. II. to-day stands without a rival as regards statistical and reference books of authority, and shows the untiring energy of its author. . . . When I come to look at the compilations of the world's statistics of the mining industry and the able articles on each branch of mining, I can only say that yourself and staff of assistants have reason to feel proud of this great work, which should be found in the library of every man connected with the mining industry.

J. R. HOLIBAUGH, Mining Engineer.
JOPLIN, Mo., June 28, 1894.
EDITOR ENGINEERING AND MINING JOURNAL:
Sir: Vol. II. of the "Mineral Industry" was duly received. It is a statistical gem, indispensable to the metallurgist.
E. J. WILSON,
Supt. The Standard Smelting and Refining Company.
DURANGO, Colo., July 3, 1894.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I have received Vol. II. of the "Mineral Industry," for which accept my thanks. The work has become indispensable in all libraries of economic science and a most valuable hand-book of reference to the geologist as well as the mining engineer.

JOHN C. SMOCK,
State Geologist.
TRENTON, N. J., July 5, 1894.
EDITOR ENGINEERING AND MINING JOURNAL:
Sir: In carefully looking over the "Mineral Industry," Volume II., I find it all that could be desired, and more than could be expected. I shall

have constant use for it. Such a book is of the highest value to all interested in our mineral production, and should receive their hearty support.

CHESTER F. LEE,
Mining Editor "The Spokane Miner and Electrician."
SPOKANE, Wash., July 6, 1894.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: It is decidedly refreshing to get hold of a volume that is up to date in its history and statistics of the mining and smelting industries. In reading this second volume of the "Mineral Industry" one cannot help feeling that he is being fully informed of the progress made in all branches of these subjects. It would be difficult to invest . . . more profitably than in the purchase of this book.

C. E. DEWEY,
Dewey Bros. Ore Sampling and Concentrating Works.
GEORGETOWN, Colo., July 9, 1894.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: . . . As to the "Mineral Industry." Its value to us is many times its cost. The chapters on bauxite, with its full data, are of constant assistance to us for reference.

SOUTHERN BAUXITE MINING AND MFG. CO.
PIEDMONT, Ala., July 16, 1894.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I acknowledge receipt of Vol. II. of the "Mineral Industry," which I consider a most important and valuable addition to the mining literature. I hope you will make the book of yearly appearance.

DR. AUGUST SCHEIDEL,
COOKE, Mont., July 16, 1894.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: We find the "Mineral Industry" a very valuable document, up to the times in every respect, not a simple lot of statistical tables, but a treatise on the ores and minerals of economic value in the United States, with a statement of mining methods and market values.

MINNEAPOLIS, Minn., July 21, 1894. "The American Geologist."

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Volume II. of the "Mineral Industry" series has come to hand. The brief examination of the volume that I have been able to make satisfies me as to the timeliness and value of the work. Its merits exceed my expectations.

EDWARD ORTON,
Professor of Geology, Ohio State University.
COLUMBUS, O., July 28, 1894.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: In acknowledging the receipt of Vol. II. of the "Mineral Industry" permit me to express the indebtedness which I, in common with a host of other mining engineers, owe to you for compiling such a mass of invaluable information within so limited a compass. The "Mineral Industry" is as full of information as an egg is of meat. To those busy men who are captains of the industry it is no small matter that they should possess a book ready at hand to guide them in the ever-widening field of professional knowledge.

T. A. RICKARD,
Mining Engineer, the Enterprise Mining Company.
RICO, Colo., July 31, 1894.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: The "Mineral Industry," Vol. II., has been received. It is just such a book as the practical geologist, the mineral producer and the manufacturer need. It contains more facts of practical value than any other work I have ever seen relating to mineralogy or economic geology. I congratulate you most heartily upon your success in producing such a valuable annual, involving such a large variety of subjects and covering such vast areas in the brief time you have devoted to the work.

S. S. GORBY, State Geologist.
INDIANAPOLIS, Ind.

BOOKS RECEIVED.

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

The Statistical Year-Book of Canada; 1893. Ottawa, Can.; Government Printing Bureau. Pages 995.

Mining and Engineering and Miners' Guide. By Henry A. Gordon. New Zealand; Government Printer. Pages 474; illustrated. Price 10s

Sixth Annual Report of the State Inspector of Coal Mines of Kansas, for the Year 1893. Topeka, Kan.; State Printer. Pages 179.

Eleventh Annual Report of the Bureau of Industries for the Province of Ontario; 1892. Toronto, Can.; published by the Department of Agriculture.

Design of the King Bridge Company's New Riveting Shop. By George E. Gifford. Reprinted from Journal of the Association of Engineering Societies; 1894. Pamphlet. Pages 14; illustrated.

Historical Sketch of the Discovery of Mineral Deposits in the Lake Superior Region. By Horace V. Winchell. Reprinted from the Second Annual Report of the Proceedings of the Lake Superior Mining Institute. Pamphlet. Pages 46.

Electric Power from British Coalfields to London.—B. H. Thwaite and James Swinburne have submitted to the Manchester Association of Engineers a plan for transmitting power from the South Yorkshire coalfield to London, with trunk lines for serving the large towns along the line of transmission, including Derby, Nottingham, Leicester, Northampton, Bedford, etc., and possibly an auxiliary station in South Staffordshire for the service of Wolverhampton, Birmingham and the industrial areas in the line of its route across to the point where it joins the main trunk line serving the metropolis. The plan is to generate power by burning coal at the pit's mouth, and to transmit the power electrically. The coal will first have its "residual products" removed. As these form the most valuable portion of the coal, the fuel actually used may be itself fairly regarded as the residual product of the distillation. Gas engines are to be employed instead of steam engines and boilers, and the power is to be transmitted by high pressure alternating currents.

THE MALACATE SILVER AND GOLD MINES OF SULTEPEC, MEXICO.

Specially Written for the Engineering and Mining Journal by Edward Halse, A. R. S. M.

Sultepec is one of the very old mining districts not only of the State of Mexico, but of the republic. Alexander von Humboldt says the veins of Zultepeque (another spelling for Sultepec) were, together with those of Tasco, Tlapujahu and Pachuca, the first ones worked by the Spaniards, and soon after the conquest, and that these veins have yielded from time to time immense riches.*

That Sultepec was at one time a very important center is clear from the remains of an ancient Spanish road of considerable width and entirely paved with stone that once led from Sultepec in a westerly direction, or towards the Indian village of "Tisca." Although a considerable portion of the paving has been washed away by the rains, parts of it are still left almost intact.

The Malacate mines, situated about four miles northwest of Sultepec, were indeed worked quite extensively by the Spaniards. It is said that records exist in the mint of the City of Mexico to show that the mines formerly produced many million dollars' worth of silver and gold. The workings themselves, and the enormous dumps existing on the side of the hill, are sufficient evidence to lead one to conclude that these mines must at one time have been in bonanza.

It is found that the old workings reach to a depth of from 100 to 300 ft. measured from the outcrops, some of which are entirely filled up with good concentrating ore. The old miners only treated the high grade silver ore by the "patio" process; the remaining leady and pyritic ores, of which there is a large quantity, were left standing or were dumped inside or outside the mine according to convenience.

The Spaniards working the mines were, it is said, wiped out early in the century by the revolutionists, then the buscones (searchers for ore in abandoned mines) got hold of the mines, numerous "caves" resulting from their irregular method of working. Moreover the workings are said to have become filled with carbonic acid gas, whereby several of the searchers lost their lives and left their bones behind them in the Capulin workings.

After this the Emperor Maximilian handed over the mines to a court favorite, which ownership of course disappeared with the fall of the empire.

After various vicissitudes the mines finally fell into the hands of the present owners, Messrs. Grant and Rock, who are now engaged vigorously opening them up with capital advanced by an English syndicate.

The geological formation of the district consists mainly of metamorphic schists—quartzose, aluminous, talcose and micaceous—of Palaeozoic age. The trend of the beds is a little north of east, and the dip is very flat to the south. The schist is traversed by some porphyritic, trachytic and granitic dykes. In the northern portion of the area there is a large dyke of yellow "porphyry" covered superficially by a certain thickness of Permian magnesian limestone. Porphyritic, trachytic and granitic dykes also occur in the northeastern, southeastern and southwestern portions of the area. The eruptive rock on the southeast, probably trachyte, appears to cut off the slate formation in that direction. Beyond this it is said that orthoclase granite forms the general formation, while to the southwest the schist can be traced for a long distance. (A. Rock.)

Señor Santiago Ramirez points out that there is a ring of porphyritic rocks surrounding this area in the shape of a horseshoe, at whose extremities are Temascaltepec in the northwest and Zacualpan in the southeast, while Sultepec lies in the center.†

This author regards the metalliferous emanations as contemporaneous with the porphyry, although the fissures themselves were formed before the porphyritic eruptions took place.

There would appear to be three systems of veins running through this area:

- (1) The most important veins running NW. to SE., or parallel to the Sierra Madre range of mountains, and dipping generally about NE. 60°.
- (2) E. and W. running veins, dip variable.
- (3) N. and S. running veins, dip generally to the E.

The NW. to SE. veins have been the only ones worked to any extent hitherto.

Malacate proper consists of four claims, La Providencia, La Cruz, El Carmen and El Gran Socabon. These have been incorporated in a zone contract of date 30th July, 1890.

The most important veins on the property belong to class (1), and are known as Capulin, San Pascual and Concepcion.

The ores occurring in the lodes are native silver, ruby silver (pyrargyrite), black sulphide of silver (argentite), galena somewhat poor in silver (sorroche), gold and silver-bearing iron pyrites, zinc blende and some copper pyrites. The gangue is usually quartz with some calcite, and decomposed "country"—heavy spar and fluorspar—are said to occur occasionally.

The ore occurs in layers, bands or streaks (cintas) parallel to the walls, divided by more or less barren vein-matter (caballetes). There are usually no selvages, and the walls are frequently ill-defined. The barren filling consists of schist, variously colored and unaltered, or decomposed to a clay.

Capulin is the most northerly vein. On the northeast wall is 8 ft. of ore which has yielded native gold and silver to some depth from the surface with high grade silver ore (petlanque), then come several feet of practically barren lode-filling, followed by a 3-ft. streak of foliated auriferous and argentiferous iron pyrites, more dead ground, then another 3-ft. rib of the same mineral, but in stringers only, and, therefore, less rich. The gangue of this lode is quartzose.

The structure of the San Pascual vein is as follows: On the north wall there is a rib of mundic and blende, then follow streaks of galena, dry pyritic, leady and dry silver ore respectively. In places these streaks are divided by more or less barren vein-matter; elsewhere the ore is continuous throughout. The gangue is quartz and calcite, with kaolinized country. In one place known as the "salon" 30 ft. of ore is exposed with the south wall not reached. The ore streaks are as a rule of good workable size varying from 2 to 4 ft. and upward in width.

The Concepcion vein runs nearly east and west, but as it forms a junction with San Pascual on the line of strike, and has not been traced beyond it, it may be looked upon as an offshoot from this vein, and the metalliferous contents are the same, but the gangue contains more calcite, and some fluor-spar.

La Cruz is a parallel vein to San Pascual, and to the south of it. It has only been proved at surface where a wide vein is exposed consisting of oxide of iron (gossan), calcite, etc.

South of this again is a parallel vein known as Veta Negra, whose outcrop is traceable for a long distance, consisting of 18 ft. of gossan, calcite, mundic, etc.

La Providencia is considerably to the north of Capulin on the east side of an arroyo running north and south, and which divides it from the other veins, but the dip is to the south; hence it is believed it will form a junction with Capulin, San Pascual, etc., in depth. The proved width in one part is 14 ft., the best ore being from 4 to 6 ft. of coarse cubical crystals of iron pyrites carrying about 80 oz. of silver to the ton, but no gold; it also has some galena and blende, and the gangue is quartz and calcite. This is the only proved vein that appears to be non-auriferous.*

The chief workings are in the San Pascual vein, and at and near the junction of this vein with the Concepcion. Both these veins have been opened up to a level of about 250 ft. from their respective outcrops.

As all the above veins, with the exception of La Providencia, lie close together and dip with the hill, they can be worked most economically by means of adits or crosscuts. One crosscut known as Dolores, about 140 ft. above the bottom workings, has already cut the Capulin, Concepcion and San Pascual veins, and is well on toward the La Cruz vein. The lower crosscut is 93 ft. below, and in driving it several "blind" veins, i. e., veins which have no outcrop or crestones, have been cut of considerable width, and which yield good ore. It is already nearly 500 ft. in length.

The dressing and smelting floors are immediately below the latter crosscut, and when the eastern and western sections of the mine have been communicated through a big "cave" of ground, all the ore from the mine will be trammed out of this crosscut direct to the mill.

There are several old crosscuts or galleries below those described. One large gallery, known as the Gran Socabon, is nearly 500 ft. below the new main tunnel, and has been driven nearly 300 fathoms into the hill. Several veins were cut in this old adit, but the forebreast is still a long way from the main lodes described. A curious feature is that all the water from the upper workings makes its way into this tunnel through a natural fissure in the rocks. The Gran Socabon is 600 ft. above the Guadalupe River, and 1,100 ft. below the top of the ridge.

The most notable vein of the Zona is one to the southwest of Malacate proper, which can be traced from just above the Guadalupe River, running straight into the hill about S. 70° E., and with a dip of about NE. 63°. The proved width is 20 ft., and it is said that the lode is spotted through out with sulphide of silver. The workings were under water at the time of the writer's visit. Directly opposite, above the right bank of the Guadalupe River, an escarpment of columnar porphyry or trachyte is seen which, no doubt, cuts the vein off in that (NW.) direction. The vein has been opened on at various points, and is traceable for at least 500 ft. in vertical height.

Careful sampling of all the Malacate veins shows that the pay-streaks will yield from \$20 to \$30 per ton on an average, and as mining, milling, smelting and administration will only cost about \$7.25 per ton an ample margin is left for profitable working.

Labor is very cheap in this district, miners being paid 50 cents and ordinary laborers 37½ cents (silver) only. The district is a good agricultural one, so living is very cheap.

Fair oak charcoal is delivered at the mines at about \$6 (silver) per ton, and firewood at between \$2 and \$3 per cord; from the veins themselves, or from the immediate vicinity, sufficient fluxes can be obtained for smelting purposes.

The pyritic ores will, of course, have to be roasted. It is estimated that roasting will cost only \$3 (silver) per ton. The dry silver ores and the leady ores will after concentration be smelted direct.

The only troublesome ingredient would appear to be zinc blende (amounting to about 1½ per cent. in the graded ores), but a great deal of this can be got rid of by hand-picking, and the remainder can be rendered harmless by careful roasting.

There is a large amount of untouched reserves in the mine, and there is sufficient ore already broken for a two-months run.

A concentrating mill, roaster and smelter are now erected, and it is expected that the plant will be running very shortly.

The plant consists of a water-jacketed furnace of 30 tons capacity, made by Messrs. Fraser & Chalmers, of Chicago. It has been made double-fronted in order to allow of its being tapped from both sides; it has a telescoped smokestack, and is provided with a special blowing engine so as not to interfere with the concentration of the ore. The concentrating plant (capacity about 50 tons per day) consists of a stone-breaker, a crusher on the Cornish system, with rolls 27 in. in diameter, four 3-compartment Hartz jiggers with the necessary sizing-trommels, and a 20-ft. revolving buddle or slime table. This plant, together with the necessary engine and boiler of 60 H. P., has been manufactured by the Walburn-Swenson Company, of Chicago. In addition there are two English cupellation and one reverberatory furnace (50 ft. by 10 ft.) supplied by Fraser & Chalmers, and two powerful duplex pumps of 150,000 and 50,000 gal. capacity respectively, supplied by the Deane Steam Pump Company of New York. The smaller pump will furnish the boilers, etc., with sweet water, and the larger one that necessary for concentration. The water will be pumped up into tanks from the level of the Gran Socabon, about 500 ft. vertically below the smelting floor.

About 750 yards of rail track has already been laid in the mines, and 10,000 acres of woodland have been secured to supply the fuel and mine timber.

The mine works and mill have been laid out by Mr. Adolfo Rock, graduate of the St. Petersburg School of Mines, with a strict view to the efficient and economical handling of the ore.

The Malacate mines were a few years ago most favorably reported on

* From 1785 to 1789 there were put into the royal treasury from the mines of Tasco, Zacualpan and Zultepeque 1,056,000 marcos of silver, an amount only exceeded by the districts of Guanajuato, Catorce and Zacatecas (Humboldt).
† "Noticia de la riqueza Minera de Mexico," 1884, p. 502.

* The gold in the various veins is by no means uniformly distributed; the general average of a large number of assays gives 939 Troy grains for every Troy ounce of silver.

by the late Professor Edmond Fuchs of the Ecole des Mines, Paris, the same expert and scientist who reported favorably on the El Boleo copper mines of Lower California. A condensed description of the Malacate mines will be found in the recently published work on Ore Deposits, by Professors E. Fuchs and L. de Launay, "Traité des Gîtes Minéraux et Métallifères," Vol. II., pages 826-7.

The writer examined these mines on behalf of the English syndicate in February and November of last year, and again in June of this year.

In order to reach the mines from the City of Mexico, one takes the train to Toluca (National Railroad), then a steam-tram from there to San Juan. From San Juan one rides on horseback through the forests, across the foot of the Volcan de Toluca, and to the mines by way of Tisca.

The distance from San Juan to Malacate is upwards of 60 miles over a road that is extremely rough in places, but it is very picturesque, and therefore amply rewards one for the fatigue of the journey.

COAL MINING IN IOWA.*

By G. A. Davis.

The developed coal-field of Iowa lies in 24 counties, and some of these have produced only small amounts. A district lying southeast and northwest from Lee County to Hamilton, along the Des Moines River, embraces 10 of the 24 counties. Four others lie in the southwestern corner of the State along the Nodaway River, and Scott County shows a small out-skirt of the Illinois field. Of the entire field Mahaska is the banner county, producing 1,172,530 tons in the year ending June 30th, 1893. Most of this coal is a good quality of steaming and fuel coal, easy of access and workable. Many of the mines are developed by drift or slope entries. Of the shaft mines none is over 250 ft. deep, while the principal ones are 125 ft. or less. The thickness of the veins run from 3 to 8 ft. and even more. The coal is worked by both the room-and-pillar and the long-wall systems, the former plan being the most used, because it requires a peculiar roof for the long-wall system, and, where it can be used it is considered the best, being safer, requiring less timbering and removing a larger per cent. of coal. A good roof of slate or stone is a great advantage in working a mine—indeed, may be said to be a necessity, as there are some veins unworkable from the fact there is not enough hard material overlying them to make safe work. In Keokuk the first large mines opened had excellent roof and no faults to make waste piles, but, the later ones have poorer roofing and large waste piles from the faults and bottom that must come up on account of thin veins. This makes these mines much more expensive to work. In general the dip of the coal vein somewhat conforms to the surface of the ground above, and, for convenience in working, the hoisting shaft is sunk in low ground, so the coal will haul down hill and the water run to the sump to be pumped out. The dip of the vein and the whole lease should be prospected thoroughly by numerous holes bored through the coal, and especially where it is proposed to sink the shaft, in order to avoid quicksand and to ascertain the lowest point for location. The size of the shaft is usually 7 x 15 ft., to provide for two cages and the necessary room for pipes for compressed air, water or electricity when required. It is mostly lined with 4 in. timbers in Keokuk County, but cases occur where even 12 in. timbers are not heavy enough. One shaft I knew of encountered a soft, bluish mud called sea-mud. This shaft is about 15 ft. deep, is said to have cost \$10,000 and was soon abandoned not only because it gave trouble, but because it was not in the best location. The average cost of sinking a shaft is about \$12 per foot in depth; the cost to timber with 4-in. stuff is \$3 to \$3.50 per foot in depth; air shaft, 5 x 10, costs about \$10 per foot in depth. Main entries are about 7 ft. wide at the bottom and 6 ft. at the top, not less than 5 ft. high or as high as the coal vein is thick. When the vein is less than 5 ft. in thickness, top or bottom is removed to give this height. Side entries may be less. In long-wall working enough of the entry roof is removed to make gobbing or packing on the sides, and the settling of the roof causes it to lock or key itself before it has settled more than half the height it was excavated. The timber used for mine props is an item of expense that varies with the conditions met with in each mine. They cost 1c. per lineal foot, delivered at the mine, for 4-in. diameter at small end. They should be straight, seasoned thoroughly and have both ends sawed square. They are not used as plentifully and carefully as they should be, the mine inspectors' records for the last biennial report showing that of 7,000 miners working in Iowa, 31 were killed and 48 were injured by falling coal and slate during the years 1892 and 1893.

The miners usually work in pairs, two men per room. They load the coal into pit cars, which the company hauls out and empties on screens of diamond-shaped bars set 1 1/2 in. apart and 12 ft. long, set at an angle of 26°, or 1/4 to 1. Accompanying each car is a numbered brass check, which is credited with the weight of lump coal sent with it. As an incentive to good work, the nut and slack are not paid for. Some men shoot the coal to pieces more than others, and good judgment in digging coal counts in dollars and cents here, as well as in other trades. The method of digging coal is about the same in all mines where the vein lies horizontal or nearly so. A room is simply enlarging branch entries. The miner with pick cuts under the face of the coal as far as he can reach, usually about 4 ft., then drills a hole about the same depth up near the roof, then puts in powder and shoots the coal down. Formerly the powder holes were drilled with the ordinary hand-drill, but now they are all bored with a miner's patent auger, with which a hole 6 ft. deep can be bored in 20 minutes. In What Cheer, iron men (picks worked by compressed air) have been introduced. With this machine (the Harrison) a man can cut under about 40 ft. face, 4 ft. deep, in a day. He will have one or two assistants, whom he pays a stipulated price per day, and he gets credit for all the coal he sends out. The company furnishes the machines and the compressed air and pays all expenses connected with them. Entry work, on an average, costs by hand-pick \$1.80 per lineal yard, and 75 cents per ton of coal removed. With machine it costs \$1.50 per lineal yard and 40 cents per ton. The proportion of nut and slack to lump in Keokuk county is

about as follows: Slack, 10%; nut, 15%; and lump, 75%. Ventilation is by fan in the large mines, and by steam jet or furnace in the smaller ones. The fan forces air into the mine, which is carried around through the various side entries and rooms by a system of stoppings in the entries until it reaches the up-cast shaft. The furnace or steam jet is placed at bottom of the up-cast shaft to create a draft from tile workings. The coal is usually hauled to the bottom of the hoisting shaft by small chunky mule, but in some cases the endless rope and tail-rope methods are used. Pit cars usually hold about 1,500 to 2,000 lbs. each, and run on track of 2 ft. 8 in. to 3-ft. gauge, laid with 12 to 18 lbs. per yard T-rail, laid on 2 1/2 x 4-in. oak cross ties placed 2 ft. apart. The cost of a first-class plant for operating a mine of say 500 to 800 tons per day capacity is approximately as follows: Main shaft, 7x15 per ft. depth, \$15; air shaft, 5x10 per ft. depth, \$10; top works, tower, screens, cages, tipples, etc., \$4,500; two boilers in place, \$2,000; boiler-house, \$300; engine, \$2,000; engine-house, \$300; track scales, \$800; pump, pipes, etc., \$500; sixty pit cars, \$20 each, \$1,200; blacksmith shop, \$200; oil house, \$100; powder house, \$100; fan, \$200; fan-engine, \$250; house, \$150; rails, spikes, etc., \$500; hardware, tools and sundries, \$2,500; total, \$15,625. If machine picks are used, add for air compressor, \$4,000, and for eight machine picks, \$3,200.

This plant will require about 13 top-men at a cost of \$25 per day, and 16 to 18 men, including mule-drivers, underground, at a cost of \$30 to \$40 per day, and from 150 to 250 miners. Patent loaders cost about \$1,500, and if the coal is clean and requires but little picking over, they are a good investment, as they save the work of from 4 to 6 men, chunking in box cars, where the mine loads 400 tons or more per day. Besides, they place the load over the car trucks instead of leaving the bulk of it piled in the center of the car. The railroad tracks at the mine should have a grade of 1 1/5 per 100 ft. from a point 100 ft. below scales, to the end of empty storage tracks. From this point, 100 ft. below scales, it should have 800 ft. of 1 1/10 per 100, and lesser grade from there on, or even level if the ground will admit of it. Steeper grades than 1 1/5 per 100 are liable to cause trouble in bad weather, while less grades on the empty track and over the scales cause cars to move hard in cold weather; and the availability of these grades should be kept in view when locating the hoisting shaft.

THE NEW YORK-JERSEY CITY BRIDGE.

The report of the Commissioners appointed by the President under act of Congress June 7th, 1894, to investigate and recommend what length of span, not less than 2,000 ft., would be safe and practicable for a railroad bridge to be constructed over the Hudson River between New York and Jersey City was filed with the Secretary of War on the 30th inst.

The Board states that "it is of the opinion that a cantilever span of 3,100 ft. in the clear could be built and would be a safe structure."

"The borings covering virtually the limits permitted by the act have been made to ascertain the character of the bottom of the river. These borings found rock at various depths, but as the borings were not extended into the rock, the absolute information of the board is that no rock exists above the reported elevation, rather than that solid rock exists below it, but the board has considered itself justified in assuming that it is a substantial rock suitable for foundation.

"The depth of the rock is about 125 ft. at each pierhead line, 260 ft. at the side where the pier of the 2,000-ft. span bridge would come. The rock rises rapidly from each pierhead line shoreward. The depth of the water is estimated to be 60 ft. at the side of the river pier. Under the water is a layer of mud or silt 100 ft. deep; below this mud is a fine sand filled with fresh water."

The weight of masonry per cubic foot was taken at 150 lbs. in air, 87 lbs. in water, 50 lbs. in mud, 30 lbs. in sand. While these high pressures have been caused in some structures they are higher than usual, and call for masonry of good quality and more than ordinary cost. The masonry is expected to finish 50 ft. above water.

The east pier would consist of four cylinders, each containing 866,000 cu. ft., costing about \$866,000, making for the four cylinders \$3,464,000.

The west pier would consist of four cylinders, each containing 1,800,000 cu. ft., making the cost of each cylinder \$2,427,000; or for the four cylinders, \$9,710,000.

The cost of the substructure for the bridge with the 2,000-ft. clear span would be—

East anchorage.....	\$131,000	West anchorage.....	\$1,038,000
East pier.....	3,464,000		
West pier.....	9,710,000		\$14,643,000

Weight of substructure, 230,000,000 lbs., including the main span, towers and two anchorage spans, giving a total length of 4,120 ft.

The site of the east pier for the span of 3,100 ft. in the clear would be the same as for the 2,000-ft. span. The site of the west pier would be the same as for that of the west anchorage for the 2,000-ft. span. Both piers will be founded practically the same depth—125 ft. below mean high water.

Estimated cost of east pier of the 2,000-ft. span bridge was \$3,464,000, so that the estimated cost of each of the two piers of the 3,100-ft. span bridge is \$4,660,000.

The total weight of the span, substructure, per lineal foot may be taken as follows:

Four chords at 4,037 1/2 lbs.....	16,150	Cross frames and hangers.....	1,920
Two webs, 3,509 lbs.....	7,018	Floor beams.....	3,000
Laterals.....	1,650	Stringers.....	1,800
Total steel per lineal foot.....	31,533		

This amounts to 100,921,600 lbs. for the 3,100 ft. span.

If a suspension bridge should be decided upon, the suspenders will either be wire ropes or cables with a stress of 30,000 lbs. per square inch of section and weight 4,500,000 lbs. for the 3,100 ft. cables. Towers are to be 570 ft. high from top of masonry, and a stress of 20,000 lbs. per square inch at the top is permissible.

Structure Steel:	Lbs.	Anchor plates.....	Lbs.
Suspenders superstructure.....	100,921,600		2,400,000
Towers.....	76,047,000	Structure steel.....	206,668,600
Chains.....	27,300,000		

at 4 1/2 c., costing \$9,300,087.

* Abstract of a paper read before the Iowa Society of Civil Engineers and Surveyors at the Sixth Annual Convention.

The Board states that this is too high and should not be over \$8,500,000, owing to the difference in character of steelwork in the two structures. Wirework cables and suspenders have been estimated at 8c. per pound making their cost—

Cables.....	79,647,800
Suspenders.....	4,560,000
Total wire 84,207,800 = \$6,736,624	

Cost of superstructure is \$16,036,711, based on 4½ cents for all structural steel.

The total cost of the superstructure for the 3,100-ft. clear span bridge would then be:

East anchorage.....	\$431,000	West pier.....	8,660,000
East pier.....	8,660,000	West anchorage.....	527,000
\$18,278,000			

In concluding the report the Board states that "the conclusion of this board is that a suspension bridge would be practicable."

The report is signed by all members composing the commission, as follows: Major W. C. Raymond, of the United States Engineer Corps; G. Bousecareu, civil engineer; Professor William H. Burr, of Columbia College; Theodore Cooper, civil engineer; George S. Morison, civil engineer.

PROPOSED TRANSMISSION OF ELECTRIC POWER IN SWEDEN.

Last autumn a royal commission was appointed for the purpose of investigating the important question of electrically utilizing the Trollhattan Waterfall, and its report has been recently completed. The commission has been at great trouble to ascertain the water-power available, and the outcome is an apparently reliable calculation, according to which the Swedish Crown has here at its disposal no less than 49,000 H. P. The Commission proposes that the Government shall utilize 20,000 H. P., and erect two separate stations of 10,000 H. P. each.

At the Gullon Island there is to be a 10,000 H. P. station, for which 74 c. m. of water per second (16,280 galls.) is to be taken from the Gullon-Toppo course of the river. Having passed the Upper Gullon cataract, the water would be conveyed to a reservoir, blasted out of the rock, from which it would again proceed to the turbines through a tunnel, also blasted out of the rock, 770 ft. long, which will have its exit at the lower border of Stora Topo Island. The fall from the reservoir to the bottom of the tunnel will be about 51 ft., and the effective fall from the turbines 48 ft.

With an aggregate water consumption of 74 c. m. per second, evenly divided between 10 turbines, and with a percentage efficiency of 72.5%, there will be an available effective power of over 10,000 H. P. Each turbine is to operate entirely independently. Alternate-current generators and transformers will produce a current at a pressure of 15,000 volts.

When this power has been fully utilized, it is proposed to build another station of similar capacity at the Spikon Island, for which the water would be taken from the course of the river on the west side of the Gullon Island, the Nollstrom fall. From here a tunnel of about 1,030 ft. would be carried under the river to Gullon, and fall into that tunnel, which from there goes to Stora Topo. The Spiko installation will thus have greater effective fall than the Gullon installation—viz., 53 ft.—so that nine turbines, with a consumption of 66 c. m. of water per second (14,520 galls.) will be sufficient to produce 10,000 H. P.

The next question is how this power of respectively 10,000 or 20,000 H. P. can be used in the best manner? The whole or part of the power might be led to some Crown property—Stallbacka, for instance—where a receiving station might be erected, and from where the power could be distributed to the various industrial establishments which it is expected would spring up; or the power, the whole of it or otherwise, might be conveyed to Gothenburg, where, according to calculations, the electric power could easily compete against the steam power at present used, which amounts to some 6,500 H. P. It might, therefore, be advisable to bring 5,000 H. P. to Gothenburg, where it would be received by two receiving stations. Customers who can do with some hundreds of horse-power, and who can provide their own lines, may rely upon very cheap power, although it is not considered necessary to fix a lower charge than 80 kr., or £4 9s., per horse-power per annum.

The costs have been estimated as follows:

A. For providing and conveying to Stallbacka electric current to the extent of, say, 3,000 H. P., with receiving station there

B. For producing and conveying to Gothenburg electric current to the extent of, say, 5,000 H. P., with two receiving stations there.

C. For producing and conveying to Gothenburg 10,000 H. P., with three receiving stations there.

In all three cases the installation at Trollhattan is built ready for the production of 10,000 H. P., but the greater the power the smaller, naturally, is the cost per horse-power, and the greater the profit, exclusive of 4% interest on the capital. Scheme A is estimated to result in a net profit of 4.82%, scheme B 7.8%, and scheme C 10.55%. The estimated costs are: For A £47,000, for B £86,000, and for C £147,000. The annual outgoings are estimated at respectively £4,600, £8,800 and £15,500.

RECOVERY OF AMMONIA FROM BLAST FURNACE GASES.*

A marked step in the direction of fuel-economy in connection with blast furnace plant was the utilization of the gases of the furnaces for steam-raising and for generating heat in connection with the hot-blast, the gases being drawn off from the blast furnace for those purposes. Of late years a further economy has been inaugurated and effected by the recovery from the gases of their contained ammonia, tar and oil, without reducing their efficiency as heat producers, or, in other words, as fuel. Numerous patents have been taken out and various systems of ammonia-extraction adopted at different works. Among others is that of J. & J. Addie, which has been in successful operation for several years past at their Langloan Ironworks, Cortbridge, N. B. The principle of the process consists in mixing with the furnace gases a sufficient volume of sulphurous acid to combine with the ammonia and thus fix it, and the subsequent washing of the gaseous mixture in scrubbers, whereby a complicated

ammoniacal liquor is obtained. At Langloan the gases are collected from the furnaces in a main tube, 7 ft. diameter, by which they are conducted to the east end of the works, where the ammonia plant is situated. In traveling to the scrubbers the gases deposit a large portion of the dust and heavy tarry matter that accompanies them. At the point of entrance to the scrubber towers is a valve for shutting off the gas from the towers at any moment. There are two of these towers, which are connected together by inclined necks, which branch off about 8 ft. from the top. These scrubbers are built of malleable iron ¾-in. thick, and are of similar size and construction, each being 66 ft. high and 10 ft. diameter. Each scrubber stands on a tank 8 ft. high and 15 ft. diameter, and fitted with a sluice-valve for running off the tar and liquor, and with connections for filling up with clean water. Two pumps, with 14-in. plungers, and working at fifteen revolutions per minute, force the liquor through a 12-in. pipe from the tanks to the top of the scrubber. Each scrubber is filled with wire diaphragms built in segments, which finely divide the descending liquor, an explosion-door being placed between each diaphragm for the escape of the gases if too great a pressure occurs. Before entering the scrubbers the gases are mixed with sulphurous-acid gas in sufficient quantity to combine with the ammonia as bisulphate.

The sulphurous acid producers, which adjoin the scrubbers, are in duplicate, and are worked on the same lines as a blast furnace. They are 16 ft. high, with a 3 ft. bosh, and are supplied with hot blast through four 1½ in. tuyeres. The charge consists of a mixture of coal brasses and pyrites smalls. The brasses, if fairly free from intermingled coal, often contain from 40 to 45% of sulphur. The pyrites smalls contain from 45 to 47% of sulphur. The sulphurous acid gas, issuing through a 2-ft. tube at about three pounds pressure, meets the blast furnace gases in the 7-ft. main before entering the first scrubber. The blast furnace gases have a temperature of about 500° Fahr. at the point of intermixture, and on the combined gases entering the first scrubber they meet a descending plunge of cold water. On leaving this scrubber they have a temperature of from 135° to 150° Fahr., and they then enter the second scrubber near the top, where they undergo a similar washing, but they travel in a downward direction. The gas, deprived of its ammonia and about 40% of the tar which it contains, is then distributed to the heaters and boilers, or wherever wanted. It contains on an average about 07 grains of sulphur per cubic foot, and burns satisfactorily. The water is circulated through the scrubbers by the pumps until it has a specific gravity of from 1.05 to 1.075 (10° to 15° Twaddell), this gravity being due to the dissolved salts of ammonia, potash, etc. When 10° Twaddell is reached in the scrubbers the relative volumes of tar and liquor are about 1 to 3, and this constitutes a good working proportion.

The scrubbers are worked as follows. Each is filled with fresh water, additions being made four times per shift. The average evaporation is about 5 ft. per shift. No. 1 scrubber is run off once every 24 hours. The liquor is worked down 1 ft. from the top of the tank, which gives a convenient quantity of liquor to handle in two stills, tar being allowed for. Before running off the contents of each scrubber the pump is stopped and the liquor allowed to stand for about 20 or 30 minutes. The heavy tar quickly settles to the bottom, with a little light tar on the surface. The sluice-valve is then opened, and the heavy tar run off into the tar-well, and the liquor into the liquor-pond. The following are some analyses of liquor of various specific gravities:

	Weight in Volume.		
	Liquor 11 2° T.	Liquor 13° T.	Liquor 15° T.
Hyposulphite of ammonia.....	2.63	2.25	2.82
Acid sulphate of soda.....	5.59	8.50	8.44
Sulphate of ammonia.....	2.03	1.63	1.12
Sulphate of soda.....	0.80	..	0.67
Sulphate of potash.....	0.86
Containing ammonia.....	2.09	2.35	2.39
Sulphur.....	3.13	..	1.37

It will be seen that the composition of the gases varies very much, especially as regards hyposulphite of ammonia, which is due to a preponderance of free sulphur in the producer-gas. It was originally intended to oxidize this sulphite of ammonia liquor to sulphate by means of air, but it was found to be impracticable on a working scale. In a series of experiments tried about two years since, it was found that Fe(OH)₂ oxidized 50% of the liquor in a very short time, a strong current of air being forced through the liquor. This showed that sulphite of ammonia could certainly be oxidized to sulphate, but the rate of oxidation is so slow as to render the process impracticable when dealing with thousands of gallons of liquor.

The plant for the manufacture of the sulphate of ammonia is of the usual description. The saturators are wooden boxes 6 ft. long, 5 ft. 6 in. wide and 3 ft. deep, and lined with 18-lb. lead. The evaporator is 8 ft. long, 6 ft. wide at the top and 3 ft. wide at the bottom, and is fitted with a double coil of lead tubing supported on leaden stays at the back end. The crystals are fished out as produced and are dried in a centrifugal machine. In working the stills, two are worked off every 24 hours. The time occupied in working off a still varies from five to nine hours, according to the strength and condition of the liquor, the average time with good lime and a good liquor being seven hours. A practical foreman can tell by the color of the liquor whether it has had sufficient lime added to free the whole of the ammonia. It generally assumes a port-wine color when the calculated proportion of lime (as against the Twaddell) has been added. The cracker-boxes require careful attention, the foreman judging entirely by smell, which is often found to be a more reliable test than litmus paper. He never allows the boxes to become too ripe, as that blackens the sulphate and prevents the evaporator boiling.

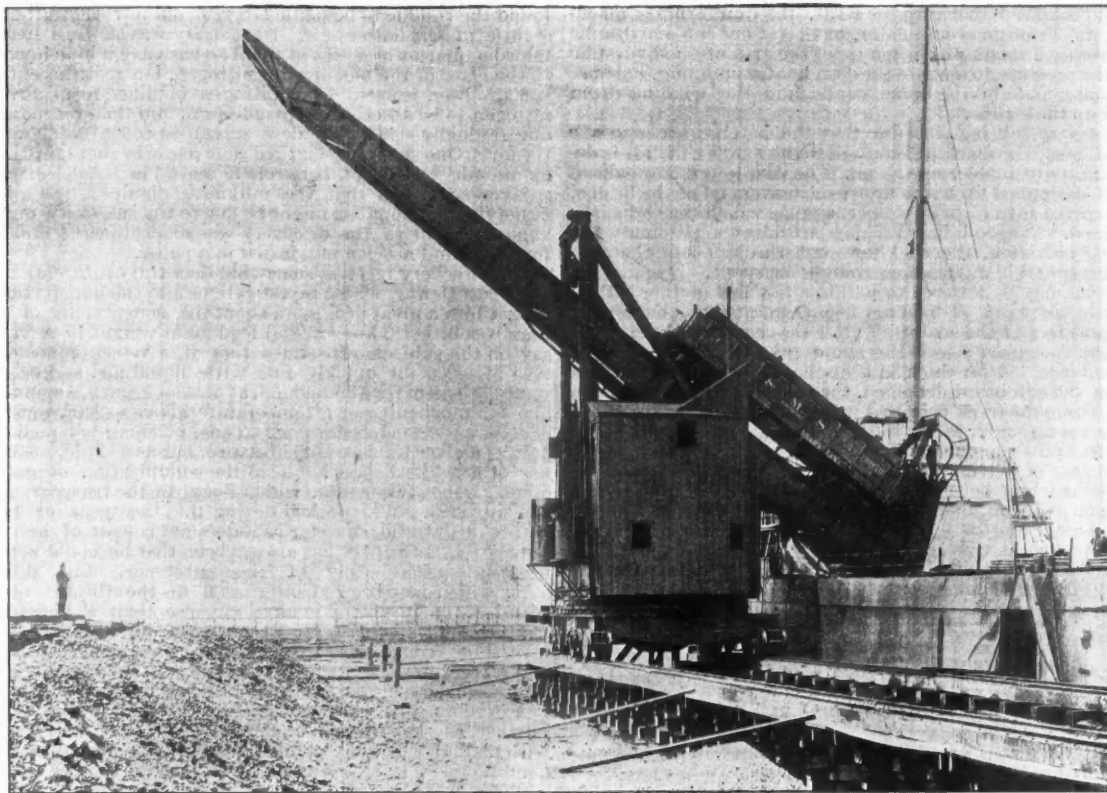
Acid Resisting Cement.—The "Bulletin Technologique" for August gives the following formulae for acid-resisting cements: 1. Silicate of potash (30° Baume); powdered pumice, 2. Powdered asbestos, 2; sulphate of baryta, 1; silicate of soda (50° Baume), 2. This resists strong sulphuric and nitric acids; for dilute acids the silicate should be 130° Baume. 3. Silicate of soda, 2; sand, 1; asbestos, 1. This is the best to resist hot nitric acid.

* The "Ironmonger," London.

A RAPID METHOD OF HANDLING COAL.

Next to the traffic in iron ore between the mining regions of Lake Superior and the furnace districts of Illinois, Ohio and Pennsylvania the movement of bituminous coal from Lake Erie ports to the Northwest is the most important item of lake commerce. For several years past, shipments of coal from the Pittsburg, Hocking Valley and West Virginia districts have averaged about 3,000,000 tons each season. This coal is of a

high grade suitable for fuel and steam purposes and for the manufacture of gas and coke, and shippers have tried various methods of loading it into vessels without damage from breakage. The effort, therefore, has been to secure dispatch for vessels approaching that obtained in the ore trade, where ships of 3,000 to 3,500 tons are loaded in a few hours and at the same time avoid loss in the commercial



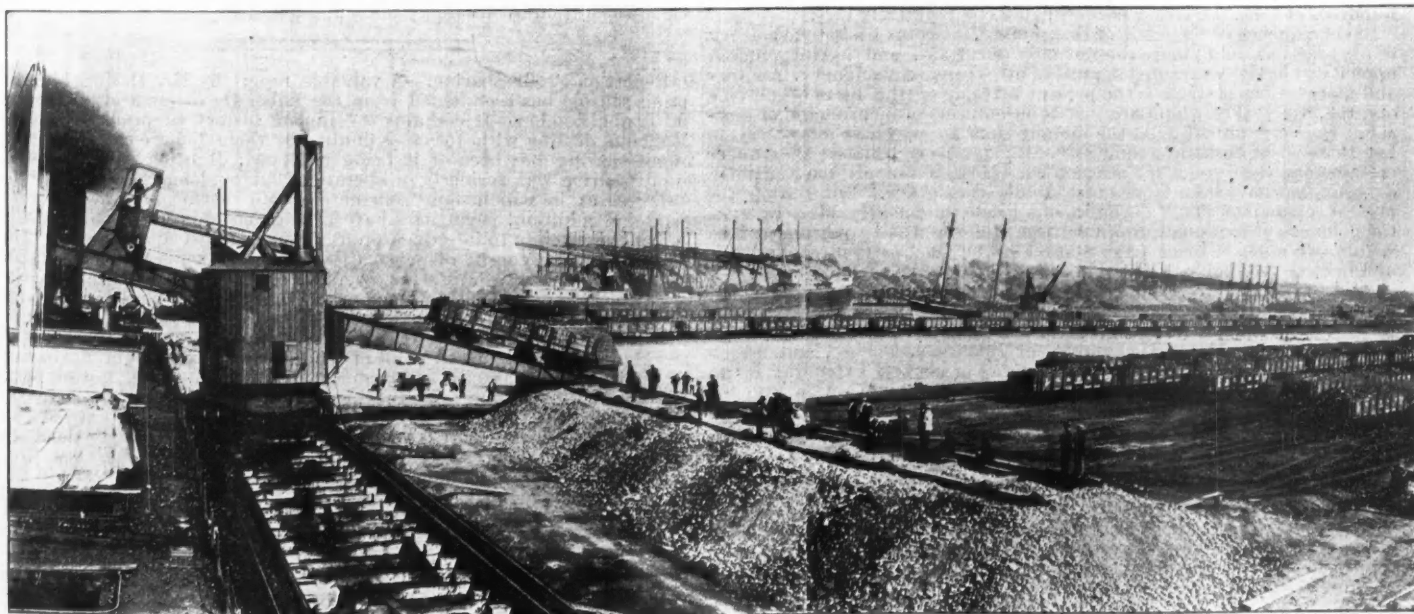
THE McMYLER CAR DUMPING MACHINE.

apparatus, and steamers ranging in capacity from 2,000 to 3,100 tons have been loaded in 8 to 12 hours.

The machine is entirely self-contained and portable, having a revolving derrick, with the addition of the girder or bridge by means of which the entire car of coal instead of a loaded bucket is taken up and discharged. All trestlework is avoided and there is nothing complicated or expensive

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McMYLER CAR DUMPING MACHINE AT ASHTABULA, O.

value of the coal by overcoming as far as possible the breakage referred to. A machine designed to meet these requirements has been constructed and is illustrated herewith.

From an engineering standpoint it is a novel affair, but it has been given sufficient trial in actual service at Ashtabula, O., to demonstrate its practicability. Patents on the machines are controlled by the McMyler Car Dumping Machine Company, a new corporation, and the first one made was built by the McMyler Manufacturing Company for Pickands Mather & Co., Cleveland representatives of the Minnesota Iron Company

about the apparatus. Aside from the machine itself the only expense is that connected with arrangements of the surface railway tracks.

Viewing the machine from a mechanical standpoint its elements may be described as a bridge of two plate girders turning on trunnions near the river or dock end of the bridge. These trunnions are carried on the framework of the house, which is in turn carried on about 100 12-in. wheels arranged in a circle after the manner of a drawbridge. The circular track on which these wheels move is supported through heavy plate girder framework by 16 large car wheels moving on four tracks, the

outer ones of which are 24 ft. apart. Back of the machine and its docks are six double lines of railway tracks, which are for loaded and unloaded cars, and are spaced about the same as the hatches of vessels and perpendicular to the line of the dock. The power is furnished by a pair of engines which control the hydraulic power, and all operating parts are controlled by friction clutches requiring but one operator to handle the entire machine and only four men in all engaged in connection with the plant. The other three are a fireman, a man employed on the bridge and a man to attach the cable to the drawhead of the car.

A hydraulic ram of 18½ in. in diameter, mounted on trunnion, tilts the bridge, which is so balanced that it rights itself, the ram forming an effective brake for it. From an accumulator, having at one end a hydraulic piston and at the other a steam piston ten times the area of the hydraulic piston, is taken the pressure to operate the clutches for pumping, hoisting and driving laterally, and also the brake controlling the winding drum that pulls the car up the incline.

In operation, the vessels being placed so that the hatches are opposite the tracks, or nearly so, the machine is moved to the hatch which it is desired to load into; the steel cable, size 1½ in., is hooked into the drawhead of the car and the car pulled up to the upper or shorter end of the bridge, which is so constructed as to form a bumper, against which the end of the car rests when tilted. The end board being withdrawn automatically through the tilting operation, the coal flows out through a discharging chute, and is concentrated in a telescopic trough or spout, which at the first flow of the coal may be lowered to within a few feet of the bottom of the vessel, when the work of loading begins at any of the several hatches, or to the surface of the coal itself after the bottom of the vessel is covered. In double-decked vessels this chute may be lowered to the between-deck combings. After the load is discharged the bridge is tilted back, the cable on the end board detached, the car allowed to run down and off the incline onto the track provided for empties, a loaded car again taken up and the operation repeated, the machine moving from one set of tracks to another and from one hatch to another as may be required by supplies of loaded cars or to trim the cargo.

Not only can the machine be moved laterally in either direction with a car on the bridge or platform, but it may be swung at the same time to avoid spurs or any other obstructions on the vessel. The capacity of the surface track plant shown in the large engraving is 140 cars, or about 3,300 tons. The work done by the machine from June 27th to August 22d has been 59,794 tons loaded in 300 hours and 40 minutes.

CHROMIC IRON IN QUEBEC, CANADA.

Specially prepared for the Engineering and Mining Journal by J. T. Donald.

There are indications that the raising of chromic iron ore may become one of the mining industries of the Province of Quebec. It has long been known that chromite occurs in pockets in the Cambrian Serpentine that stretch through the Province from the Vermont boundary to Gaspe, and in the past a few tons of the ore have been taken out at various times and from various points. But disappointment in the mode of occurrence of the ore, and in the price that could be obtained for the same, led to a speedy abandonment of the attempt to mine it.

So far as can be learned, the total amount of chromite mined in Canada during the past 10 years is less than 100 tons. One of the chief obstacles to chrome ore mining in Canada, common to the great majority of places where this ore is found, is the mode of occurrence. It is rarely found in beds or veins, but in detached pockets which yield from a few pounds to hundreds of tons, the larger pockets being comparatively rare.

In consequence of the mode of this mining, investors hesitate to embark in a species of mining more than usually uncertain, and having entered upon it do not feel warranted in putting up expensive machinery. Another and more serious obstacle is the present attitude of the users of chrome ore, the principal of whom are the manufacturers of bichromate of potash. These are unwilling at the present time to purchase ore carrying less than 50% of chromic sesquioxide, although it is believed that under certain conditions ore of 48% is accepted. Most, if not all, the Canadian deposits that have been tapped are below this grade. But during the present season deposits of chromite of a grade sufficiently high to meet the demands of manufacturers have been discovered and are being worked within two miles of Black Lake Station on the Quebec Central Railway, and in close proximity to the well-known Black Lake asbestos mines.

A large body of prospectors is out searching for chrome deposits, and finds are reported, but as yet only three lots are being worked. The pioneer lot in this district, and that on which most mining has been done, is the property of Mr. M. H. Lambly, of Inverness, Quebec, and associates. In this the chromite occurs in a series of pockets extending in an east and west direction, and the series in an easterly direction into the adjoining lot. In these two lots some of the pockets are lying against a dyke of fine grained granulate, but whether there is any relationship between the igneous rock and chromite it is impossible to say. Other pockets seen elsewhere in the vicinity are not associated with the granulate, but those in which the granulate lies against the chromite have yielded a large amount of ore of very fine quality. From one pocket on the Lambly property nearly 500 tons have been taken out, and it is still producing. The writer selected two hand specimens of this Lambly ore as free as possible from foreign matter, and found them to yield an analysis 54% and 56.02% of chromic sesquioxide.

It is evident, of course, that a shipment of ore would not average as high as these selected hand specimens, and that careful dressing would be necessary to insure that shipments should not fall below the grade the market demands. Mr. Lambly states that a shipment of two cars tested 51% and realized \$26 per ton of 2,240 lbs. delivered in Baltimore, which is equal to \$20.50 per ton f. o. b. at the mines.

Collieries in India.—The number of collieries in India in the year 1893 was 96, giving employment to 37,679 persons, and having an output of 2,529,855 tons of coal.

NEW GASEOUS CONSTITUENTS OF THE ATMOSPHERE.

At the recent meeting of the British Association at Oxford, Lord Rayleigh and Prof. W. Ramsay announced that they had discovered a new gas in common air—one more inert than nitrogen—in consequence of noticing that nitrogen obtained from common air differed in density by about one-half per cent. from nitrogen obtained from other sources. They obtained the new gas by subjecting some common air to electric sparks, absorbed the nitrous fumes so produced with potash; and the excess of oxygen with pyrogallol and caustic potash, after which they found the residue to be neither oxygen nor nitrogen, although it contained a little of the latter gas. Its density was at least 19.09; they had obtained a quarter of a pint of it. The gas gave a blue line in the spectrum, in the place of the blue line of nitrogen, but more accentuated. The gas has also been isolated from nitrogen obtained from air, by causing that nitrogen to be absorbed by magnesium, and then the density of the residue gradually rises. The new substance constitutes 1% of the nitrogen of the air. One speaker remarked that there is room for three spaces, with an atomic weight of between 19 and 23 in Mendeleef's table. Another speaker suggested that the milkiness obtained by Professor Dewar in liquefying common air might be due to the substance under notice. The announcement of the discovery was made to the section briefly and informally, and not communicated in a paper.

The discovery receives somewhat doubtful confirmation at the hands of Professor Dewar, whose investigations into the liquefaction of gases have taught him a great deal more about the constituents of the atmosphere than was hitherto known, and lend great weight to anything he has to say on the subject. He states that if a vessel be cooled to a temperature of -200° it quickly fills with liquid air, and every gaseous substance, elemental or compound, at present known, amounting to anything like 1%, and boiling at a temperature above -200° , must become liquid or solid under such conditions. Thus, when air is liquefied it does not appear as a clear transparent substance, but as a fluid containing more or less of a white deposit, due to the solidification of carbonic acid and other gaseous impurities, which floats in the transparent liquid oxygen and nitrogen. When asked during the last year or two what is the nature of the solid, in so far as it does not consist of known atmospheric impurities, his answer has always been that he could not say, not having made a special study of the substance. Can this substance, he asks, which has been so often seen in the theatre of the Royal Institution, be in the main anything else than Rayleigh's new nitrogen in the solid form? If a hitherto unrecognized substance, elemental or compound, exists in air, having a density of about 19, and present to the extent of even a minute fraction of 1%, chemists would infer that the material must be less volatile than nitrogen or oxygen, and, therefore must be condensed with them in the process of liquefaction. Further, as the nitrogen of liquid air boils off first, leaving the oxygen with its higher boiling point behind, so the new substance ought to remain liquid or solid after both these substances have distilled off. If the white solid (known impurities of course excepted) be not the new gas of Rayleigh, then the gas must liquefy along with the nitrogen and oxygen, and be approximately equal in volatility with one or the other. Then, on the other hand, the white substance certainly does not amount to one per cent. of the liquid, and whenever the professor has casually examined it the substance has turned out to be a mixture of nitrous oxide, carbonic acid and some other impurity. Therefore the amount of any unknown substance must necessarily be extremely small. One is forced to the conclusion that if the new nitrogen is present to the extent of $\frac{1}{2}$ to 1 per cent., and has a density of about 19, then it is, indeed, a strange substance, being as volatile as nitrogen or oxygen, and, therefore, not capable of separation by difference of boiling point.

Report on Profit-Sharing.—A valuable report by Mr. D. F. Schloss on profit-sharing has been issued from the Labor Department of the Board of Trade, London. It contains a complete history of profit-sharing in England, dealing with 165 cases in all. Of these 152 are cases in which profit-sharing has been or is being practiced, 51 being cases in which profit-sharing was formerly in operation, but no longer exists, and 101 being cases in which some scheme of profit-sharing is now in force; while, in addition, particulars have been given regarding four cases in which the attempt to introduce profit-sharing proved unsuccessful. The remaining nine consist of seven cases in which bonus-giving (as distinguished from profit-sharing) is now, or formerly was, practiced (comprising two cases in which this practice was abandoned, dissatisfaction with its results having in both cases been experienced by the employers, and five cases in which bonus-giving is now practiced), and of two cases of stockholding by employees. Out of the 101 cases of present profit-sharing (involving from 27,000 to 29,000 employees), three date back upward of 20 years (profit-sharing arrangements having been adopted in 1866, 1869 and 1873 respectively), nine others can boast of an existence covering more than 10 years, while the whole of the remaining 89 cases have occurred within the last 10½ years, 21 of these belonging to the period 1884-1888 inclusive, 60 to the years 1889-1892 inclusive, four having come into existence last year, and the other four in the first weeks of the present year. Mr. Schloss continues: "An examination of the details in relation to the 51 cases in which the method of profit-sharing has been adopted by British employers, but is not now in force, suggests the conclusion that this system has not met with anything like universal success. It must, however, be borne in mind that the warmest advocate of the system would never maintain that profit-sharing is an absolute panacea against commercial disaster; nor are we asked to believe that, in all cases alike, the introduction of profit-sharing arrangements is invariably followed by an improvement in the industrial efficiency of the employees, and by an amelioration in the relations between employers and employed." Mr. Schloss urges that the facts and opinions set forth prove that profit-sharing, in one or another of its numerous forms, is considered by practical men to increase the efficiency of employees and to establish more harmonious relations between employers and employed. The great difficulty he sees to be the jealousy and hostility with which the majority of trade unions regard schemes of profit-sharing.

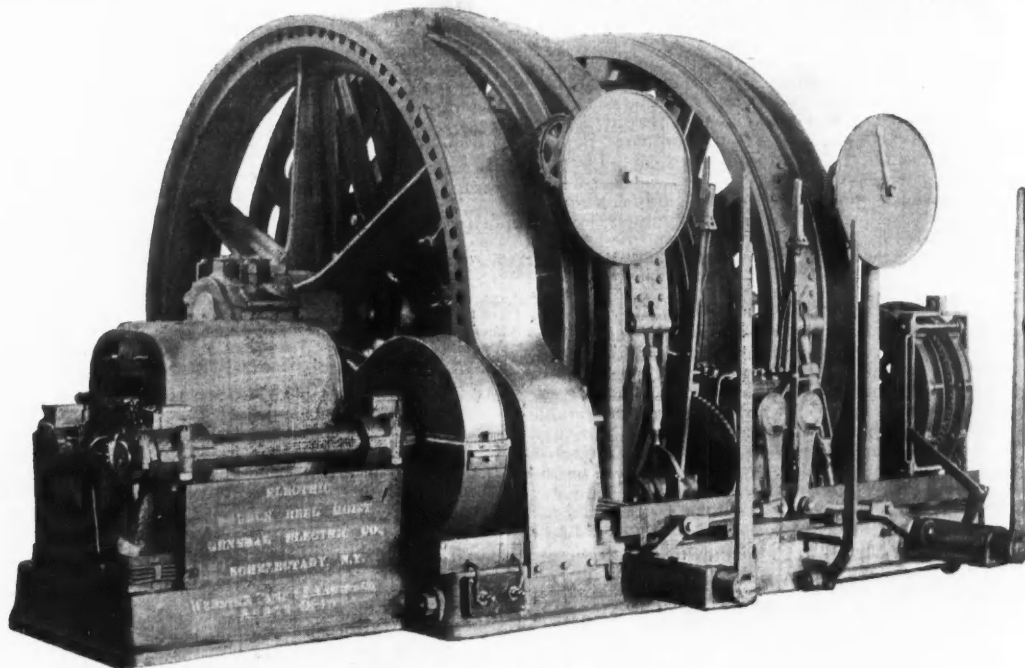
ELECTRIC MINING HOIST.

The introduction of electrical apparatus into mines goes on apace, either as auxiliary machinery or as the main machinery upon which the entire operation of the mine must depend. An interesting installation has recently been made by the General Electric Company in a silver mine in the South, in which electrical apparatus plays a very important part.

The generating plant situated at the mouth of the mine consists of two engines 10½ and 16 × 12. These are connected through friction clutches to a common shaft carrying a band wheel, and each engine operates one D-62 General Electric generator having 500 volts potential and 85 H. P. output.

The power-house also contains a separate 9 in. × 9 in. McIntosh & Seymour high-pressure engine, operating an arc dynamo of 18 lights capacity and a 150-light incandescent dynamo. The pulley upon the common shaft is to be used to operate a third D-62 generator as soon as the extensions in the mine warrant the addition, while a 500-light alternating plant, which is also to be installed, will be run from a separate engine, and will supply light for a town about two miles distant.

The current is carried from the power-house to the tunnel of the mine and the various shafts over insulated copper wires. At shaft No. 1, 1,000 yards from the mouth of the mine, two hoists have been installed, one of the single type operated by a 16-H. P. motor, the other of the double-reel type. At a distance of about a mile from the station is shaft No. 3, which is equipped with a 25-H. P. single-drum hoist. Shaft No. 1 still retains its steam hoist and is provided with a small direct-connected plant of the marine type.



ELECTRIC MINING HOIST.

The electric, double-reel, flat-rope hoist is one of the largest ever made, and has just been completed by the General Electric Company. It nominally works in balance, and has a capacity on each side of 5,000 lbs., the mean speed of the rope being 500 ft. per minute. The motive power is furnished by a General Electric, 125-H. P. motor of the L. W. P. 20 type, similar in size to the large ones used to propel the cars of the Intramural Railway. The lower frame of this motor is provided with feet, which allow of it being bolted to the bed-plate of the hoist. The maximum demand on the motor will be about 80 H. P. when the hoist is working singly. Under normal conditions, that is when it is hoisting in balance, the demand will be about 50 H. P.

The hoist itself is very compact, the dimension of the base, exclusive of the motor, being 9½ ft. square, the width being increased by about 3 ft. 4 in. by the addition of the motor. The height is about 7½ ft. above the foundations, the reels, however, extending a little below the level of the bed plate. The reel centers are 4 ft. apart and have a capacity each of 1,000 ft. of flat rope ½ in. × 3½ in. The diameter of the naked reel is 3 ft.; this when wound with the rope is increased to 8 ft. On account of the direct relation between the working diameter of the reel and the weight of the rope unwound, which forms a considerable part of the load, the work done by the motor remains practically constant.

When the load is started from the bottom of the mine the weight of the rope, about 2,500 lbs., is added, but it is being wound on an 18 in. radius. When the load nears the top, only the ore and the skip are being lifted and the winding radius has increased to 48 in. The average speed of the intermediate shaft is 200 revolutions per minute, which gives a starting speed to the skip at the bottom of the mine of 400 ft. per minute and at the top 600 ft. The regulation is therefore automatic.

The entire weight lifted from the bottom is about 5,500 lbs., 2,000 lbs. of ore, 1,000 lbs. of skip, and 2,500 lbs. of rope. The reels are loose on the shaft, the hubs having brass bushings which may be readily renewed when worn. To each reel is cast on the side a polished clutch ring 5 ft. in diameter, and upon this is fitted a Webster, Camp & Lane band friction clutch, the ring keyed upon the shaft.

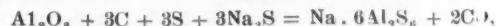
The brake rings are keyed to the reel and are 7 ft. 6 in. in diameter, with an 8½ in. face. Each is designed to allow for expansion of the brake when lowering, which heat may bring about. The reel shaft is of steel, 6 in. in diameter, the journals being increased to 8 in. at the center, and

run in bearings babbitted and adjustable. The indicators on the front show the position of the cages. The weight of the hoist complete is about 3,200 lbs., and no part is so large but that it can be lowered into the mine, the tunnel of which is 7 ft. × 8 ft.

A NEW ELECTROLYTIC METHOD OF PRODUCING ALUMINUM.*

The following method, described in a general article on the newer applications of electricity to mining and smelting, by W. Wendelen, has been proposed by the Aluminium Company of Neuhausen, Switzerland. The material operated upon is aluminum sulphide, which can be readily dissociated by passing an electric current through it when melted, the fusion being effected either by the current itself or an external source of heat. As compared with other methods, a comparatively low electromotive force is required to accomplish the reduction, and the carbon electrodes immersed in the bath of molten sulphide are not affected, as the reduction takes place at a temperature below that required for the combination of carbon with sulphur. Short-circuiting is also completely prevented, as the reduced aluminum, on account of its higher density, falls to the bottom of the reducing vessel.

As, however, pure aluminum sulphide is difficult to produce, and, consequently, expensive, it may be replaced by a double sulphide of aluminum and some alkali metal, that with sodium obtained by heating alumina with carbon, sulphur, and sodium sulphide according to the following equation:



being the most convenient one, as it is readily soluble in a bath of molten alkaline chlorides and fluorides. The best material for the bath is a mix-

ture of potassium and sodium chloride kept melted by external heat. When this is used, a low-tension current is sufficient to effect the reduction of the aluminum with almost quantitative exactness and of a high degree of purity. When the fusion is to be effected by heat derived from the current, higher electric energy will of course be required, but even then it will rarely be necessary to exceed five volts. The reducing vessel is a cast or wrought-iron box lined with carbon, which, like the electrodes, is not injured by the process.

Metallurgy.—What is called a new branch of metallurgical science has just been opened up in France, which is likely to have an important influence upon the iron and steel industry in that country. This discovery is due to the researches of the Commission which was formed in 1891 by the French Government, with a view of determining upon some more accurate method of testing constructive material than at that moment existed in France, and to the absence of which was attributed—however groundlessly—the failures of important bridge and other works that had become unpleasantly frequent. A report upon the inquiry of the Commission has just been drawn up by MM. L. Bacle and Debray, who set forth results that are considered by them, and by those who thought the Commission necessary, to be of the greatest value to the metallurgical industry. By the aid of a microscope it is said to be found possible to detect molecular changes in metals, that vary according to the constituents of which they are composed. The changes of appearance are of almost infinite variety; and each of these appearances are said to show accurately the presence of certain elements, some of which may be in such small quantities as to be undetected by chemical analysis. For instance, the presence of phosphorus in tin bronze causes a characteristic granular appearance that cannot be confounded with any other constituent, and the smallest quantity of aluminium will produce a distinct change in the metal. The value of this new science of "Metallurgy"—as it is called—lies particularly in the fact that it will allow of the most delicate alloys being made, and it opens up a very wide field for metallurgical research; but its value in bridge construction seems remote, and does not point the way to design bridges that will stand with insufficient material, nor avoid the necessity for experience in the proper disposition of material.

* Institute of Civil Engineers. Foreign Abstracts.

CORNISH TIN MINING IN PHOTOGRAPH.

WITH SUPPLEMENT.

This week we present two more illustrations in our series showing the methods of underground working in the tin mines of Cornwall. The first shows a "pare," three men, engaged in the somewhat difficult work of driving a vertical hole upward, one with his hammer on the drill finishing his blow, and the other just starting to swing forward for his stroke. Their only light, apparently, comes from the candle set on a hammer handle in front. Some of these men do remarkably good work in drilling, as shown at a hand-boring contest held in connection with an exhibition of mining machinery, organized by the Mining Association and Institute of Cornwall, in 1888. A block of granite was placed in convenient position and eight minutes given to each of the competitors, three men, or a "pare," being allowed from each mine. The Tincroft men bored 13 in. in 6 minutes 43 seconds, striking 91 blows. The nearest approach to this was the Dolcoath "pare," which drilled 12½ in. in 7 minutes 18 seconds, striking 130 blows. Fig. 13 shows stopping in progress on the 70 fathoms level in East Pool mine. The roof, it will be noted, is solid and requires no supports.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

SUPREME COURT OF PENNSYLVANIA.

Liability for Lease of Miners' Houses.

The assignee of a lease of a colliery, and also of a lease of miners' houses, by covenant with the lessor, assumed payment of the price of a breaker sold by the latter to the lessee, and of the fixed rent of the miners' houses. A conveyance of the land by the lessor did not give the grantee the right to accrued rents, or the price of such breaker and improvements, and defeat the right of such lessor to recover the same against such assignee. It appeared that such assignee was relieved from paying rent for the colliery because prevented from mining coal by causes beyond his control, as provided in the lease. The covenants to mine and to pay rent for the houses, were not made dependent on each other, and the only exemption from liability was for coal not actually mined for such causes. It was held that the assignee was not relieved from paying rent for the miners' houses.—*Big Black Creek Improvement Company vs. Kemmerer*.

Construction of Mining Lease.

A lease of all the coal on certain land reserved a royalty on all coal mined that would pass over a ½ in. mesh, and provided that the lessor should have all the culm, and might enter and remove it at any time; the lessee to use so much of the culm as he might need for any purpose about his works. It appeared that "culm" meant merely unmarketable coal, and that smaller sizes would be more marketable at one time than another; and that when the lease was made the sizes that go through a ½ in. mesh were not thought worth a royalty, and were thrown on the culm-pile; that lessors reserved the culm with the idea that some day means might be found to utilize it. It was held that the lessor could not recover from the lessee the value of the coal he had sold that would pass through a ½ in. mesh.—*Lance vs. Lehigh & Wilkes-Barre Coal Company*.

Construction of Will as to Mineral Rights.

Testator, after providing for his wife, gave to his daughter "The farm on which she now resides; which is to be her share of my estate, and, should the coal be opened on said land, or sold in a body, she . . . to have an equal share with the other heirs." To his son he gave 50 acres, where he now lives. The mineral right is reserved. He is to pay out of mineral right certain debts. To each of his six other sons and daughters he gave "an equal share with the other heirs of my whole estate." Testator died seizer of a large body of unimproved land, which was chiefly valuable for the coal known to underlie it. It was held that each of the sons and daughters took an equal interest in the "mineral right" of testator's real estate. *Christy v. Christy*, 29 At. Rep. 781.

Portuguese Coal and Iron.—In Portugal there are three distinct coal deposits. In the north, near Oporto, the coal is anthracite, of good quality, but often so mixed with shale as to render the working difficult. The principal mines are St. Pedro da Cora, Passal de Baisco, Covello and Midoes, Pejao. The coal extracted from these mines is used in Oporto for cooking ranges and stoves, and the soft coal is made into briquettes (patent fuel) for the same purpose. Near Busaco, at Santa Catharina, there are some coal beds of a semi-bituminous coal, but these mines are not now being worked. Iron ore is found distributed generally all over Northern Portugal in larger or smaller degrees. The only large deposit is at Moncorvo, about 80 miles up the River Douro. This iron is magnetic, and the supply is very large, but the distance from a seaport renders it valueless until a railway or other means of communication enables it to be shipped at a small expense.

Manganese Steel.—Manganese steel (13% of manganese) is not magnetic, and of all the alloys of iron it is the one which presents the highest electric resistance. It is the more malleable the more energetically it has been tempered. There is a second allotropic variety which is magnetic. M. Le Chatelier has determined the conditions of the transformation of the two varieties of manganese steel into each other. To convert the non-magnetic into the magnetic metal it is heated to 550° from one to two hours. To convert the magnetic metal into the non-magnetic metal it is heated to 800° and cooled rapidly, so that the inverse change may not be produced between 500° and 600°. The expansion of the two varieties of manganese steel has been found alike, which excludes the existence of a change of dimension at the point of transformation. Manganese steel tempered in water on reheating undergoes a contraction of 0.4 mm. in 100 mm.

Estimation of Sulphur in Coal.—A method whereby the sulphur in coals may be estimated and their suitability for gas-making determined before purchase, has been introduced by Herr W. Hempel, an authority on coal gas in Germany. The coal to be tested is powdered and pressed in a little platinum wire cylinder, to which a long platinum wire is attached, and then burned. The combustion is effected in an ordinary glass bottle, which is fitted with a trebly perforated india rubber stopper. Through this passes a tube with a glass stopcock and which widens out into a cylinder; also two glass tubes, to the lower ends of which two thick platinum wires are fused. One of these wires carries the platinum cylinder or basket already referred to. A little mercury is poured into the tube so as to establish sure contact with the wires which lead the electricity. When the current is passed the platinum basket becomes white hot, the combustion of coal is effected, and the gaseous products containing the sulphur compounds are led off through the stopcock and examined chemically.

Proximate Constituents of Coal.—The "Interim Report of the Committee Appointed to Inquire into the Proximate Constituents of the Various Kinds of Coal," British Association, Oxford, August, 1894, shows that this committee has started its labors. Coal from Hutton Seam, which is bituminous and used as a gas coal, has been used in the following investigations: Heated with ether, it yields a yellow solution with blue fluorescence. Alcohol, benzene and petroleum ether dissolve but little from it, the solutions being similar to the ethereal solution. On this coal acetic anhydride and glacial acetic acid have but little effect as solvents; but a solution of sulphur dioxide in glacial acetic acid, when heated at 100° with the coal in a close pressure flask, becomes dark in color, and, on the addition of water, yields a light yellow precipitate. The precipitate is soluble in ether, and the solution on evaporation leaves an oily residue. Turpentine heated in a pressure flask with the powdered coal darkens and acquires a greenish-blue fluorescence. Aniline dissolves an amorphous solid from the coal when heated with it; the solid is precipitated from aniline by means of hydrochloric acid. This solid leaves resinous residues from its alcoholic and benzene solutions, is oxidized by dilute potassium permanganate, yielding a dark brown solution containing potassium carbonate and potassium salts of organic acids. The coal itself also reduces permanganate and yields a dark colored solution containing, amongst other things, oxalic and other acids.

PATENTS RELATING TO MINING AND METALLURGY.

United States.

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

TUESDAY, AUGUST 28TH, 1894.

- 525,002. Water Wheel. Prescott S. Buckminster, Angel's Camp, Cal. Wheel of the impact type.
- 525,024. Method of Making Artificial Marble. Pierre A. Moreau, Meung, France. Coloring porous stone by immersion in a color bath and then in a solution of sulphate of zinc.
- 525,027. Rolling Mill Apparatus. John M. Price, New York, N. Y. Frame for adjusting position of rolls.
- 525,045. Blast Feeding Apparatus for Furnaces. Edwin Cartwright, Milwaukee, Wis., Assignor of one half to William Doyle, same place. Combination of steam-jet and air heating stove.
- 525,072. Gas Purifying Apparatus. George E. Gilhaus and John A. Richter, Kansas City, Kan. Combination of water-tank, spray-wheel and conveyor, with purifying chamber.
- 525,093. Coal Drill. John Collier, Justus, O. Combination of drill bar, frame and gearing.
- 525,113. Reverberatory Furnace. Michael J. Murdoch, Youngstown, O. Arrangement of heating chamber flue and connections.
- 525,131. Process of and Apparatus for Making Gas. William F. Browne, New York, N. Y. The carbon is submitted to the direct action of flame from burning hydrocarbon.
- 525,144. Rock or Ore Breaker. Ryerson D. Gates, Oak Park, Ill. Combination of two vibrating jaws with an interposed anvil.
- 525,181. Car Loading Machine. Thomas Beck, Des Moines, Ia. Combination of frame, carrier and chute.
- 525,197. Manufacture of Pipes. George W. Fox, Manchester, Eng. Machinery for simultaneously forming the tube and coil wire around it.
- 525,207. Rolling Mill. James Hemphill, John F. Wilcox and Joseph Fawell, Pittsburg, Pa. Combination of rolls and feeding tables.
- 525,263. Rolling Mill. Joseph Fawell and James Hemphill, Pittsburg, Pa. Combination of rolls with separate reversible engines.
- 525,283. Apparatus for Sawing Stone. Matthew L. Ritchie, New York, N. Y., Assignor to himself and Browne & Magown, same place. Combination with the frame and saws of rock-shafts and yokes for carrying the stone.
- 525,296. Method of Converting Cast Iron into Steel. William N. Taggart, Philadelphia, Pa., Assignor of one half to Henry C. Meyers, same place. The method consists in immersing highly heated cast iron in a bath of animal oil and crude petroleum.

Great Britain.

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

WEEK ENDING AUGUST 11TH, 1894.

- 11,972 of 1893. A. McDonald, London. Purifying sulphate of lead fumes by heat instead of by washing.
- 14,130 and 14,131 of 1893. J. Hargreaves and T. Bird, Widnes. Improvement in Patent 18,571 of 1892 for electrolytic apparatus.
- 16,724 of 1893. W. S. Lockhart, London. Disintegrating clays, slimes, etc., by freezing and afterward thawing.
- 17,700 of 1893. C. Raleigh, Johannesburg. Screens for stamp batteries, with welt wires woven oblique to warp wires.
- 18,831 of 1893. W. Wolters, Novgorod, Russia. Adding sulphate of lead to sulphuric acid in concentration apparatus, to reserve the lead from the attacks of the acid.
- 9,536 of 1894. A. G. Fell, New York. Method of treating lead ores to produce litharge or acetate and nitrate of lead.
- 11,797 of 1894. E. D. Kendall, Brooklyn. Peroxide of sodium and cyanide of potassium for extracting gold from ores.

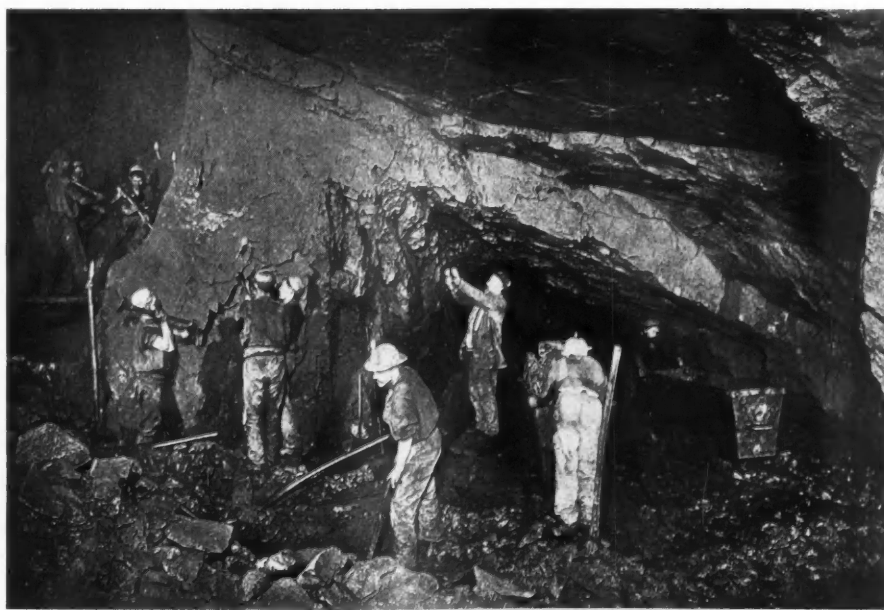
WEEK ENDING AUGUST 18TH, 1894.

- 17,961 of 1893. J. Drach, Vienna. Electric exploders, in which current is induced by a solenoid drawn away from a permanent magnet.
- 7,998 of 1894. A. W. Schwarz, Leipzig. Using nitrogen chloride for blasting purposes.
- 11,664 of 1894. T. Drake, Huddersfield. Improvements in electrolysis of salt.
- WEEK ENDING AUGUST 25TH, 1894.
- 16,763 of 1893. A. Gordon and J. Gordon, Loanhead, Edinburgh. Recovery of cyanides from blast furnace gases.
- 16,848 of 1893. W. He-lon, Bridlington. Coal tubs made of corrugated sheet iron.
- 19,375 of 1893. W. F. Berner, St. Petersburg. Combination of blast furnace with steel producer or refiner, so as to produce wrought iron or steel direct from ore in one continuous process and with one heating.
- 22,452 of 1893. B. J. Atterbury, London. Concentrators for ores.

SUPPLEMENT TO
THE ENGINEERING AND MINING JOURNAL, SEPTEMBER 8, 1894.



12. BORING AN UPPER, EAST POOL MINE.



13. STOPING AT THE 70, EAST POOL MINE.

CORNISH TIN MINING IN PHOTOGRAPH.

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PERSONALS.

Dr. A. B. Ledoux, receiver of the Harney Peak Company, has gone on a visit of inspection to the company's property.

Major N. H. Hutton, engineer to the harbor board of Baltimore, has been appointed consulting engineer to the Philadelphia canal commission, which will supervise surveys to determine the feasibility of constructing a ship canal across the State of New Jersey.

OBITUARY.

William Curnow, coal inspector for the Lehigh Valley Coal Company, was killed by a train at Mt. Carmel, Pa., on September 5th.

Samuel Frack, a prominent citizen and the founder of Frackville, Pa., died at that place on September 1st. He was at one time interested in oil wells in Venango County, and later was connected with various industrial enterprises.

James C. Welling, president of the Columbian University of Washington, D. C., died at Hartford, Conn., on September 4th. Dr. Welling was widely known among public men and persons engaged in literary and scientific pursuits.

Josiah Parsons Cooke, who died in Newport, R. I., on September 3d, was born in Boston in 1827, and was educated at the Boston Latin School and at Harvard College, from which he was graduated in 1848. He became a tutor in mathematics, and subsequently, during the year 1849, an instructor in mathematics. In 1850 he was made Erving professor of chemistry and mineralogy, and it is principally due to his efforts that this course from very small beginnings has reached its present standard. He first introduced laboratory instruction into the undergraduate courses of an American college and he successfully worked to introduce inductive methods of instruction into the undergraduate departments and preparatory schools. In addition to his work as an instructor at Harvard, Prof. Cooke has lectured in various American cities, and he has written several works which have been translated into foreign languages. In 1872 he was elected to the National Academy of Sciences, and he was also an honorary fellow of the London Chemical Society. In 1882 he received the degree of LL. D. from Cambridge University, England. In 1889 he received the degree of LL. D. from Harvard University.

SOCIETIES AND TECHNICAL SCHOOLS.

American Society of Civil Engineers.—A meeting was held on September 5th, at which a paper on "Some Notes on Hot Bath Tests for Cement," was read by Frederick H. Lewis and J. Edward Whitefield.

The Federated Institution of Mining Engineers.—The annual general meeting of the members of the Federated Institution of Mining Engineers was held in Newcastle-upon-Tyne on Wednesday, September 5th, at 12 noon, in the Wood Memorial Hall of the North of England Institute of Mining and Mechanical Engineers, Newcastle-upon-Tyne. The following papers were read, or taken as read: "The Stetefeldt Furnace," by Mr. C. A. Stetefeldt; "Walling and Sinking Simultaneously with the Galloway Scaffold," by Mr. John Morison; "Timber Bridges and Viaducts," by Mr. Morgan W. Davies; "Explosion in Nova Scotian Coal Mines," by Mr. Edwin Gilpin, Jr.; "The Shaw Gas Tester for Detecting the Presence and Percentages of Fire-Damp and Choke-Damp in Coal Mines," etc., by Mr. Joseph R. Wilson. The following papers, which have been printed in the "Transactions" of the Institute, will be open for discussion: "Geology of the West Yorkshire Coalfield," by Professor Lupton; "The Transmission of Power by Compressed Air," by Professor Goodman; "The Baum Coal-Washing Machinery," by Mr. F. Baum; "Notes on Coal-Getting Machinery," by Mr. T. H. Wordsworth; "Photography in Coal Mines," by Mr. H. W. Hughes; "The Coalfields of Sonora, Mexico," by Mr. James Overend; "The Oil Shale Industry of France," by Mr. G. Chesneau; "Spontaneous Combustion in Mines," by Mr. W. S. Gresley; "The Friction of, or the Resistance to, Air-Currents in Mines: Addenda," by Mr. D. Murgue.

The Iron and Steel Institute.—The summer meeting of the Iron and Steel Institute was held at Brussels, August 20-25th, and it has proved one of the most successful on record, no fewer than 500 members and their friends being present. Only two days out of the five were devoted to the reading of papers, and the remainder of the time was spent in visits to the noted Belgian iron and steel works, and to the Antwerp exhibition. There were many reasons for this meeting being well attended. For one thing, Brussels is a very pleasant city to visit; then it is also very close to England; no doubt also English manufacturers were particularly desirous of seeing the Belgian processes which are able to turn out iron and steel at such low prices; fourthly, the Antwerp exhibition offered a considerable inducement

The first two papers read on August 21st were on "The Iron and Steel Industries of Belgium," by Monsieur A. Gillon, and on "The Mining Industry of Belgium" by Monsieur A. Briart. The former was read in French from manuscript, and copies were not circulated among members. The latter was chiefly spagaphical and statistical, and will form a useful work of reference. The next two papers were really the most important ones of the sitting, and they were discussed at some length. They were on "The Use of Caustic Lime in the Blastfurnace" by Sir Lowthian Bell, and on "The Influence of Aluminum upon the Carbon in Ferro-carbon Alloys" by Mr. T. W. Hoggis, of Newburn Steelworks. Abstracts of these two papers with some account of the discussion we give below.

The remaining papers were read on August 22d. Their titles were: "The Early History of Crucible Steel" by Mr. R. A. Hadfield; "Notes on Electric Power, with Special Reference to Works Driven by Electricity in Belgium," by Mr. D. Selby-Begge; "The Iron Ores of the Mediterranean Seaboard," by Mr. Arthur P. Wilson; "Color-gages for Carbon Testing," by Mr. W. G. MacWillan; "The Manufacture of Steel in the Open Hearth," by Monsieur J. A. Lencauchez and "The Manufacture of Coke," by the late R. de Solderhoff. Of these papers the only one which excited discussion was that by M. Lencauchez, whose description of the hastening of the open hearth steel process by blowing elicited many interesting reminiscences of previous attempts in that direction.

INDUSTRIAL NOTES.

The wages of employees in the bar department of the Sligo mill, Pittsburg, have been reduced 10%.

The name of the Oliver & Roberts Wire Company, Pittsburg, has been changed to the Oliver Wire Company.

The Elliott Car Company, of Gadsden, Ala., has an order for 10,000 car wheels from a firm in Southern Georgia.

The Phoenix Iron Works, of Phoenix, Pa., is now running on three-quarter time. It is now employing 2,200 men.

The Rome, Ga., Cotton Tie Manufacturing Company, will shortly resume work, after being idle nearly two years.

The Roanoke, Va., Rolling Mill was sold at public sale for \$25,000 to Samuel Crozer, president of the Crozer Iron Company.

The output of the Edgar Thomson Steel Works at Braddock was 3,325 steel rails in one turn, one day last week—the largest record yet made.

The Union Metallic Cartridge Company, of Bridgeport, Conn., has placed the order for three large buildings with the Berlin Iron Bridge Company, of East Berlin, Conn.

The Hazard Wire Rope Works, Wilkes-Barre, Pa., has made a reduction of 10% in the wages of its 200 employees. Foreign competition is announced as the reason for the cut.

The Valentine Iron Company, at Bellefonte, Pa., is now employing over 500 men. Its blast furnace was started up last week after being idle since the coke strike was inaugurated.

The Okonite Company, Ltd., is doing a good business in its insulated wires and cables, and report that sales for August exceed those of any other month during the current year.

The Cleveland Machine Screw Company, Cleveland, of which Thomas H. White is president, and J. D. Climo secretary, has given notice of an increase in stock of from \$20,000 to \$300,000.

The Pennsylvania Steel Company has been employing 3,500 men of late, and it is reported that orders on hand will require the addition of several hundred men to this number in the near future.

The Union Iron & Steel Company's mills at Youngstown shut down last week on account of lack of water. The work of changing pipes connecting with the river will require until the end of this week.

The converting department of the Lackawanna Iron & Steel Company's South Works at Scranton, Pa., broke its record with an output of 5,723 gross tons from two 9-ton converters, in 11 turns, two weeks ago.

The furnaces of the Alabama Iron & Railway Company, at Sheffield, Ala., were sold last week under decree of the court. A Mr. Gordon, of Philadelphia, Pa., a judgment creditor, bought the plant for \$70,000.

Jones & Laughlins, of Pittsburg, Pa., have ordered from the Morgan Engineering Company, of Alliance, O., one of the latter's 15-ton electric motor traveling cranes, for use in a new roll shop now being built at their mills.

The Cleveland, Cincinnati, Chicago & St. Louis has given an order for about 8,000 steel posts to the International Steel Post Company, of Chicago. This makes about 10,000 of these posts purchased by this railroad company to date.

The Lady Ensley furnace at Sheffield, Ala., blew in on the 21st inst. It will run on a soft high silicon iron which is admirably adapted for mixture with Northern coke iron. One of the Alice furnaces in Birmingham will blow in shortly.

The Chilled Roll Foundry, of Apollo, Armstrong County, Pa., with a capital stock of \$100,000, was chartered at Harrisburg, Pa., last week, with G. G. McMurtry, Allegheny, president; William Boyd and V. Preston, of Pittsburg, directors.

The Bloomsburg Manufacturing Company was incorporated in Harrisburg, Pa., to manufacture iron and steel, with a capital stock of \$250,000. F. J. Richard is president; J. L. Richardson, J. I. Richard, George C. Ray, George J. Richard, all of Bloomsburg, directors.

At Gladstone, Mich., the contract for the Cleveland Cliffs Iron Company's dock at its proposed furnace plant was let last week at \$15,000. It will be 600 x 175 ft. and will have 17 ft. of water in front of it. A survey is being made to bring the Northwestern road into the city.

The Bucyrus Steam Shovel & Dredge Company report that it has lately received orders for shovels from the Messrs. McArthur Brothers Company, duplicating the previous order for large and powerful steam shovels, also from E. D. Smith & Co., Wilsoa & Jackson and others.

The coke plant of the Stewart Iron Company, near Uniontown, Pa., started up in full on August 31st. This plant was the first in the region to close down after the strike began, and is the last to start up. Superintendent Van Dusen hired his men from the ranks of the strikers.

The Douglass furnaces, Sharpsville, Pa., have been put in blast again on their established grades of foundry irons, and Rogers, Brown & Company, of Cincinnati, with their branches, St. Louis, Chicago, Buffalo, Philadelphia and New York, have been appointed sole selling agents.

The Birmingham Rolling Mill Company has just completed extensive improvements to its plant at a cost of \$81,000. The new machinery put in included a plate mill, gas-heating furnace, annealing furnace, shears, two sheet mills, etc. It is said that operations will be resumed about September 5th with 1,250 men.

The Portage Iron Works at Duncannon, Pa., resumed operations in all the departments on September 3d. The resumption ends an eight months' strike among the puddlers, who have finally accepted the wages of \$2.75 per day, the rate first offered by their employers. The works will go on double turn and will employ 550 men.

The Brady's Bend Coal & Iron Company, Brady's Bend, Pa., capital, \$1,000,000, has been chartered in Pennsylvania. Directors are Charles O. Billings, Winchester, Mass.; Jerome D. Gillett, Isaac Freeze, William D. Judson, Amos Tenny, Wayne Griswold, New York; William E. Tuslin, Wm. J. Hammond and Wm. J. Hammond, Jr., Pittsburg.

The Chesapeake & Ohio Canal Company has a force of men at work on the water-way, cleaning the bottom and sides of the tangled mass of grass that has grown up, to the impediment of traffic. Work is now being carried on between Williamsport and Hancock, where the growth has been particularly strong. The machine being used is a strong harvesting mower with closed wheels to keep the growth from clogging the wheels. It is attached to the rear end of a big scow that is drawn by two horses, and requires two men to work it through the assistance of a block and tackle.

The direct process is to be given a trial at the Riverside Works, at Wheeling, O. This process is the one in which the hot metal is taken from the furnaces and to the converters, and at once made into steel. The process is not used at any of the mills of this locality, but was tried some time ago at the Bellaire Nail Works and proved unsuccessful. About the only mill using the method to any extent in the district is the Edgar Thomson Steel Works, near Pittsburg. If the new process is satisfactory it will be a great boon to the company, but will throw the coke wheelers and other workmen from employment. At the Riverside about 40 workmen will be thrown out of employment if the change is made. It is thought, however, if the test proves successful, it will soon necessitate more furnace capacity, which will give work to more men in the long run. The changes would greatly increase the output of the plant, and at the same time lessen the expense.

MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" of what he needs he will be put in communication with the best manufacturers of the same. We also offer our services to foreign correspondents.

who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufacturers in each line.

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

GENERAL MINING NEWS.

ALABAMA.

Cleburne County.

Annie Herne Extension.—The sulphurets are getting heavy and giving much trouble. As a consequence work has been abandoned until a better process than amalgamation can be introduced.

Lucky Joe Mine.—Active operations have recently been resumed and an effort will be made to make the mine pay.

Lucky Joe Mining Company.—Work is being carried on steadily, but no new developments have been made recently.

Talladega County.

Riddle Mine.—The ore here is a hard white quartz, two strata lying between the talcose slate country rock. Mr. Riddle, the owner, is working on a small scale with a five-stamp mill.

ALASKA.

Alaska-Treadwell.—A number of extensive improvements have been made during the summer in enlarging stores and adding to the facilities for handling material. A new dynamo has been secured to furnish light for underground work.

Cross Bay Mine.—The owners are driving in a crosscut so as to reach the ledge, which is about 80 ft. in.

ARIZONA.

Pima County.

(From an Occasional Correspondent.)

Oro Blanco District.—This is one of the oldest districts in Arizona, and one of the few which still maintains a distinct organization. It is situated about 68 miles southerly from Tucson, with which mail connection is had by triweekly stage. Nagales, on the Sonora line of the Santa Fe Railway system, is distant 30 miles in an easterly direction, but the mountains between are very rough, and no direct road has been built, although one is now commenced. The southern limit of the district is the international boundary line.

Up to recent date little attention had been paid to the gold ores of this district, and it is doubtful if any mining camp in the country, a dozen years old, could show so little development. This is chiefly due to the fact that the most of the prospectors are also cattle owners, and do not devote their attention to mining matters exclusively. But of late, with silver ores at such a discount, prospecting for gold has received quite a strong impetus, and, as a result, several good gold-bearing lodes have been struck. The ores of the camp are of various classes. Heavy Galena with zinc and some silver, silver chloride ores, amalgamating silver and gold ores, and free gold ores carrying very little silver. There are some peculiarities in the ores. Even the so-called free gold ores have not been satisfactorily worked by plate amalgamation, owing to changes which have taken place after the ore is mixed, changing the gold from "fair" to "misty." In this action lead and bismuth appear to play an important part. Can amalgamation, however, overcome this difficulty?

The ore-veins of the camp appear to run generally from N. W. to S. E., dipping northeasterly. They are, as a rule, on contact between a pale or reddish diorite and a soft red porphyry, the diorite forming the foot-wall. While the veins are usually of quartz, there are some lines of contact where the soft porphyry shows to the eye very slight traces of quartz, but where, for several feet in width from the diorite, the porphyry carries gold in very satisfactory amount. The deepest work on one of these latter contacts is now about 60 ft., and it is reported that the rock is growing more silicious. The percentage of sulphides in the gold ore is small. At the most 2% of sulphides. All concentrates are shipped to smelters, generally via Tucson.

The properties of the camp which are at present opened sufficiently to be called mines, are the Montana, Austerlitz Group, Yellow Jacket, Ragnarole, Golden Eagle, St. Patrick and Old Glory. Among the claims or groups which are showing favorably are the Tres Amigos, San Juan, Frankie Cleveland, Ora, Nil Desperandum and Last Chance. The milling facilities, present or in progress, are the Yellow Jacket mill, 20 stamps, Bars process, built by Fraser & Chalmers; the Austerlitz, Wiswell mill and pan-amalgamation, with concentrator machinery furnished by the Overland Machinery Company of Denver. The Montana having made a careful test of their ores in the Austerlitz mill with satisfactory results are now bringing a 10-stamp mill from Tombstone. The Old Glory Company is at present erecting a mill of reported capacity of 60 to 80 tons per day. The Griffin pulverizer will be used.

The Golden Eagle has a small portable mill for testing purposes, but is building a dam to provide water supply for a larger mill.

A water supply may be insured here in two ways, by deep wells or dams across the gulches. Just at this time very little work is being done in the camp, but there is reason to expect improvement as the general business of the country grows better.

CALIFORNIA.

Mono County.

Bodie Consolidated Mining Company.—An official letter from the mine, dated August 26th, says: We hoisted to the surface 26 tons of ore during the week from the stope above the north drift from crosscut No. 1 300-ft. level. Number of tons in the ore houses to date, 319 tons. Estimated value of the same from \$45 to \$50 per ton. Our ore houses at the mine and mill are full, so did not hoist any ore to the surface since the 22d inst. The stope above the 300-ft. level has improved in quantity and quality the last few days. The stope is now about 5 ft. wide, but the ore has to be sorted before going into the ore chutes. Upraise from the south drift 50 ft. south of west crosscut standard line, was extended 9 ft. The face is in porphyry. Have commenced to stope out ore north and south from upraise from south drift 30 ft. above the 300-ft. level. The seam is from 4 to 5 in. wide and of good grade. We will commence crushing ore in the mill to-morrow (August 27th).

COLORADO.

The receipts at the Denver mint for the month of August amounted to \$612,912.35. For the corresponding month last year they footed up only \$202,735.32.

Boulder County.

Gold Nugget.—This mine has been attached by the Boulder National bank for money advanced to the company some time ago. There are several other attachments on the mine aggregating about \$9,000.

Ward District.—The following items of Ward mining news are taken from our Boulder exchanges: At the Evening Star the leasers continue to produce ore for the smelters. Last week a car load was shipped to Denver which yielded fairly well. The Modoc mine, formerly run by the Shotwell Brothers, but now under the management of C. W. Betts, is turning out a good grade of mineral for the smelters, while the milling stuff as it is passed through the company's mill at the mine makes a first-class concentrate.

In Camp Bloomville everything is in a prosperous condition. The Huntington mill is doing good amalgamation work. Although slow, it answers the purpose for which it was erected, to satisfy the owners of the property that the ore from their several lodes is free milling and contains a good quality and quantity of gold. In the spring a mill of greater capacity and another make will be placed in the present building, while the mines will be operated more extensively.

J. E. Norling, of Chicago, president of the Centennial mine, Sunset, who has been inspecting his mining properties, says a mill will be built by his company in the near future to treat the ore from the Centennial mine. Recent developments have opened out large bodies of peacock ore of good quality for smelting, while the milling stuff is increased in the mine.

Clear Creek County.

A. Menneppi & Co., lessees on the 675-ft. level west, on the same mine, had a mill run last week of two classes, returning respectively 2,517 lbs. 193 oz. silver and 54% lead, and 6,575 lbs. 74 oz. silver to the ton and 18% lead. A mill run of 1,649 lbs. of concentrates from the dump by Joe Prout returned 265½ oz. silver to the ton and 11% lead.

Mendota, Georgetown.—The gross output of the Mendota mine for August was a little over \$4,000, showing a decrease of several thousand dollars compared with the same period last year. Mr. Old, the owner of this property, furnishes the following statement: The total gross output from the Mendota group of mines for the seven months of this year foots up \$30,258.45. As compared with the same period for 1893, this is a falling off of over 200%. The present development work consists in extending the Factory tunnel toward the Frostburd and the Combs and Captain Wells lodes; also, in running the west level from the Sherman mountain tunnel toward the Frostburd discovery, and in extending the so-called Tyler level east from the Turpin shaft to a connection with said discovery, which will include the raise to the bottom of the same.

Seven-Thirty.—H. Anderson & Co., lessees on the 80-ft. level east of the Seven-Thirty mine have shipped two lots of ore. There were 7,089 lbs. of first class, which run 392½ oz. silver and 21½% lead. The second-class, 9,321 lbs. ran 162½ oz. silver.

Lake County.

(From our Special Correspondent.)

Commercial Mining Company.—Some twenty tons daily of good iron ore are being mined from the Clipper shaft. Some carbonate and galena are also being mined which run well in silver. The manager, Mr. S. M. Carleton, expects to resume sinking this week, and a depth of 100 ft. more will be sunk. There are known bodies of ore that will be disclosed by additional sinking, and the new work will improve the property.

Golden Eagle Mining Company.—At a meeting of the board of directors held August 30th, a dividend of 2½ cents a share on outstanding stock was declared payable on September 5th.

Indiana Mining Company.—On the Wolcott & Esther shafts some important prospecting development work is being prosecuted. Numerous stringers of good ore are encountered in this new work, and it is expected that some new ore bodies will be opened up. Shipments for August were about 600 tons.

Iron Lode.—Another gold prospect is the Iron Lode on Little Ella Hill, where a strike of good gold ore has just been made. Work is being pushed at present to determine the extent of the ore opened up, which, although not very rich, will pay to ship.

Mahala and Greenback.—The latter property is shipping about 80 tons a day through the Mahala shaft. On the Mahala, shipments have slackened somewhat, owing to some important development work that is to be done. An upraise of 100 ft. is being made in order to more easily handle the body of ore opened up by No. 2 shaft some time ago. This upraise is being made about 200 ft. northeast of No. 2 shaft.

McHarg.—Lessee Clanton is sinking this shaft, which is now down 400 ft., another 100 ft., in the expectation of disclosing a body of carbonate ore at that depth.

Resurrection Mining Company, Leadville.—An injunction has been issued restraining the sheriff from selling the mining claims belonging to this company. It appears the properties were bought by John Harvey as trustee for the creditors. In the mean time Jacob Weil presented a claim for \$12,000, and the sheriff filed a lien on the various claims and would have sold them on August 27th had not a writ of injunction been granted. The properties include the New Year, Grand View, Galconda, What Is Left, Resurrection, Kokomo, D. H. Moffatt, Maxey, Neil, Jew, and seven-eighths of the Christmas. Harvey bought the claims for enough to satisfy the judgment, which was \$16,038.80.

Seneca.—The lessees of this property are working on Maid ground and have commenced their shipments through the Seneca shaft, shipping about 1,000 tons a month of carbonate ore which assays about 3 oz. silver and about 40% lead to the ton.

Union Leasing Mining Company.—This company's properties are being actively worked, and the combination is one of the best in the camp. Mineral is being taken from the Bangkok, Jamie Lee, Tip-Top, Forepaugh and Alpha ground, and the other shafts are used for hoisting purposes. A plant of machinery is being put in place on the Jamie Lee, and this, too, will be made a hoisting shaft, making five in all. Eight hundred gallons of water per minute are being handled through the El Paso, or drainage, shaft, which could handle twice that amount if necessary. About 200 men are employed, and shipments average 100 tons a day.

Pitkin County.

According to the local papers silver mining is noticeably advancing toward its former importance in Aspen. With the starting up of the Argentum-Juniata last week, preparations for which had been in progress since spring, a new impetus was given work on Aspen mountain. The Deep Shaft property is advertised for sale by trustee, but it is said that its matters may be straightened out and operations resumed on the property before winter.

There is still some prospecting for gold in the vicinity of Independence, and a little work is being done at Difficult Creek, but it appears that Aspen will be obliged to rest on her honors as a silver camp alone.

Ashcroft.—There is very little work being done in either Ashcroft or Woody districts. At Ashcroft the Montezuma group is being worked by Alexander McDonald under lease, and Manager Crowther, of the Express group, is working four men in prospecting.

Bushwhacker.—A contract for sinking the Bushwhacker incline 100 ft. below the Cowenhoven tunnel level has been let. This incline is now down but 75 ft.

Famous Mining and Improvement Company.—This company's concentrator has started up on 21-oz. Little Annie ore. The mill will try to handle some of the Mollie Gibson's low grade ore also. The Annie concentrates assayed from 80 to 95 oz.

Pride of Aspen.—The Ellis brothers, who have a lease on this property, shipped a carload of ore last week that netted them \$1,200. They have recently leased the old Aspen Mining and Smelting Company's smelting plant on Castle Creek and will try to handle their own ore.

Schiller.—Some good ore is being shipped from the Schiller by the lessees, who were former employees of the company, and were given the mine to work to secure their back wages from the product. At the present rate the men will be paid up in a few weeks, when the property will revert to the company.

West Aspen Mountain Tunnel and Drainage Company.—This company has let a contract to run their tunnel 100 ft. or to ore. Work has already begun.

FLORIDA.

Clay County.

Black River Phosphate Company.—This company has been repairing several lighters lately at Mid-

dlesburg in order to facilitate its phosphate shipments.

Escambia County.

Prior to the strikes of the Alabama coal miners the Export Coal Company, of Pensacola, was shipping an average of 1,000 tons of coal a day to Mexican, Central American and West Indian ports. This business gave profitable employment to a large number of laborers, who have been idle for two months. Now, that the strike is over, the shipment of coal through this port has been resumed, the men are all at work at the coal chutes, vessels and barges are being loaded.

Hillsborough County:

Peruvian Phosphate Company.—This company started up its works at Tampa last week. The capacity is 50 tons every 24 hours.

Polk County.

United States Phosphate Company.—This company is working full time with a large force of hands getting out pebble rock. A new and more powerful boiler is now being built by the Merrill-Stevens Company at Jacksonville, and will shortly be put in place on the dredge. Another high-pressure force-pump has also been ordered by the company, and it is expected that with the new machinery at work the daily output will be increased 25 or 30 tons of pebble.

GEORGIA.

Lumpkin County.

Boly Field Mine.—A party of Dahlonega miners have formed a syndicate to open and operate this mine, which lies on the Chestater River.

Hedwig Mill.—This mill is nearing completion, most of the 40 stamps now being in position. Work on the long flume lines is being pushed.

Lockhart Mine.—A new company has leased this property and placed Mr. John A. Peck in charge.

Singleton Mine.—A new chute of ore has recently been opened.

IDAHO.

George H. Eldridge, geologist of the United States geological survey, has arrived in the city to inaugurate the work of making a geological survey of this State in accordance with the plans recently promulgated by the director, says the Boise City "Statesman." His party is now at Missoula, Montana, and he will join it there in a few days and lead it into Idaho at a point, probably, on the headwaters of the Clearwater. It is the purpose this fall to make a hasty reconnaissance of the State so as to secure a general idea of the work needed. Mr. Eldridge will make a report to the department of the results of this preliminary survey, and during the winter plans for detailed work will be formulated. Little or no geological work has ever been done in this State by the government, and nothing is known of its geological characteristics. This reconnaissance will demonstrate that there is a fine field here for the geological branch of the survey and will no doubt lead a very important work. Mr. Eldridge will this fall visit some of the more important points in Idaho county, pass through Lemhi, Custer and Boise counties and then make a trip to the Seven Devils, winding up the season's work with an examination of the Owyhee country. His plans are not yet matured, but he will so lay out his trip as to cover as much of the county as possible.

Boise County.

Banner Tunnel.—On this tunnel, near Banner, work is progressing well, and it is now nearly 600 ft. in. The water is being rapidly drained from the old workings.

French Ledge.—Work was lately resumed on this mine, which had been abandoned several years ago. An arrastra, run by a large waterwheel, has been put up and started with ore. There is no shaft over 30 ft. deep, but a tunnel has been run in 130 ft. and some good ore found.

Olympia.—A good force is now at work in this mine. A mill has been bought, and the machinery is expected soon.

Granite County.

Red Lion Mine.—It is stated that a number of men are at work on this property, and that the 10-stamp mill may be started.

Lemhi County.

Bever Creek Placers.—Howe Brothers have been working for the last four months on their property on Beaver Creek. They commenced at the mouth of the creek and have put in a 1000-ft. flume and are piling for bed rock. They have not reached this yet, but are finding pay gravel. The work will be continued all winter.

Columbia Consolidated Mining Company.—This company has 20 men at work in its mine near Salmon City.

Yellow Jacket.—This company is now employing 35 men on its mines near Salmon City.

Shoshone County.

Bluebird Mine.—Joseph Arbicor has sold this mine to the Bunker Hill & Sullivan company, which adjoins one of its claims. The purchase price is not made public, but it is said to be a handsome one.

Mother Lode.—William King and Mr. Wiltsie, owners of this gold mine at Murray, have been to Coeur d'Alene City to ask Judge Holleman to enjoin the Treasure Box Company from further interfering with the working of the Mother Lode mine, which was shut down by the turning off of the water by the Treasure Box owners.

KENTUCKY.

Eastern Kentucky Cannel Coal Company.—This company still refuses to sign the scale, but is loading coal now on hand under the protection of United States Deputy Marshal Sanders and his posse. Recently the posse was fired upon from ambush and many shots struck the cabin in which the officers were stationed. The intention is to work the mines, and the miners are determined not to permit the completion of loading, hence serious trouble is expected.

MICHIGAN.

Copper.

Tamarack Mining Company.—Treasurer Thomas Nelson has received this letter from the mine: "In the No. 3 shaft we have got through the lode in the east end, and find it a full 19 ft. in width. As we are the proper depth for plat, we are now cutting the usual plat on the north side, and a smaller one on the south side. I find this better in this instance than confining ourselves to one plat. At present depth the foot wall of the lode is out about in the center of the shaft, so that when we sink again below the plats we shall have 9 or 10 ft. of lode more to sink through in the western end, and if it continues to improve in that end as it has done since we first had it at that end, the lode will be good enough. The piece we have squared down in the western end now, about 7 ft., is rich from the hanging as far down as we have gone." Treasurer Nelson is reported by the Boston "Herald" as saying that the story from the lake that the Tamarack Company is to issue stock to equip the new shafts is not true; that the subject has not been thought of.

MINNESOTA.

Itasca County.

Rainy Lake District.—Arrangements are under way to erect two five-stamp mills on Shoal Lake near Wiggins mine. The 100 stamp mill to be erected at Alice A. mine will not be put in place until winter, when it can be brought in over the ice.

Little American Mine.—The mill is broken down, but will be started as soon as a new spring can be secured. The last clean-up gave excellent returns and the superintendent states that the ore body is improving markedly.

MISSOURI.

Jasper County.

Ritter Mine.—Eric Hedburg, M. E., of Goplin and Robert Allen of Burlington, Ia., have purchased this mine and are erecting a hoisting plant. In future the mine will be called the "Burlington."

(From our Special Correspondent.)

Joplin, Sept. 3.

The production of zinc and lead ore for the week ending Saturday evening was fully up to the average, but the shipments were light from Webb City and Carterville on account of the scarcity of cars. Zinc ore was in good demand throughout the week at Carterville at \$20 per ton for best grades, and \$20.50 per ton was paid for eight carloads. The top price at Joplin was \$20 per ton. Lead ore dropped \$1 per thousand about the middle of the week, and then advanced 25c., closing at \$17.25 per thousand. The ore market is in rather an unsettled condition, and operators are undecided whether to increase their working force or not. Some think that zinc ore will not fall below its present price, while others are of the opinion that it will still advance. The present condition of the metal market would not indicate a very strong advance. The following are the sales of ore from the different camps: Joplin, 789,000 lbs. of zinc ore and 434,490 lead, value \$14,677; Carterville, 1,064,530 lbs. of zinc ore and 174,010 lead ore, value \$12,539; Webb City, 590,430 lbs. of zinc ore and 61,400 lead, value \$6,353; Oronogo, 74,370 lbs. of zinc ore and 77,740 lead, value \$2,011; Pleasant Valley, 117,920 lbs. of zinc ore, value \$1,208; Zincite, 41,720 lbs. of zinc ore and 5,190 lead, value \$463; Galena, Kan., 1,230,000 lbs. of zinc ore and 146,000 lead, value \$13,000; Spring City, 44,900 lbs. of zinc ore and 14,930 lead, value \$659; Granby Mines, 295,650 lbs. of zinc ore and 93,930 lead, value \$4,315; Peoria, 1. T., 43,420 lbs. of zinc ore and 11,190 lead, value \$391; Aurora, 850,000 lbs. of zinc ore and 242,600 lead, value \$16,450; Stotts City, 160,000 lbs. of zinc ore, value \$1,288; Springfield, 84,000 lbs. of zinc ore, value \$777; lead and zinc belts' total value, \$74,136.

The Gregory Mining Company, located on the Rex Mining and Smelting Company's land, which has been closed down for some time, has recently started up under the management of Mr. J. R. Dangerfield, formerly of the Standard Mining Company, at Zincite. The underground workings have been surveyed and plated, and the present work is being confined to explorations and driving a new drift to an ore body proved up by a drill hole. In the past this property was a large producer, but the workings

were confined to but a small area so that new ground must now be opened up before the concentrating mill can be started up and kept running.

Prospecting is still being carried on west of Joplin at the head of Leadville Hollow, and some good strikes are being made of both lead and zinc ore.

MONTANA.

Granite County.

The claims purchased recently by Chas. D. McLure, near Rock Creek, are being developed by J. T. Carroll, foreman of the combination, and seven men. There are said to be 17 claims in the group.

Royal Mine.—A new body of ore was found in tunnel No. 2, and work in it is progressing rapidly. About 40 men are employed.

Jefferson County.

Elkhorn Mining Company, Limited.—The superintendent's monthly report for July says: The mill was shut down for four days during the month for a thorough overhauling of the machinery and replacing the fire end section of the roaster. This is the first general shut-down since the early part of November last. The work done during July was: Ore on hand August 1st, 1894, 57½ tons; raised from the mine (including 15 tons of slimes), 1,171 tons; smelting ore and waste sorted out, 256½ tons; mill pulp recrushed, 22 tons; dry ore panned, 1,050½ tons; pulp in the mill, 10½ tons; rough ore in stock, 33 tons.

The millwork was as follows: Dry tons panned, 1,050½ tons; average assay value, 40.51 oz.; average percentage salt used, 14; average value of tailings, 3½ oz.; average percentage saved, 92; dore bars produced, 40; fine silver, 37,655 oz.; pure gold, 29½ oz.; batteries in service, 25 days 18 hours; pans in service, 27 days; estimated value of bullion shipped, \$22,595; actual returns for ore shipped, \$11,698; total, \$34,293; current expenses, including salaries, labor and supplies, etc., \$20,146; profit for July, \$14,148.

Montana Mineral Land Development Company.—At the annual meeting recently the following directors and officers were chosen: Board of Directors: Joseph A. Myers, Milwaukee, Wis.; George R. Best, Milwaukee, Wis.; Charles Sprenger, Port Clinton, O.; B. J. Spitzig, Cleveland, O.; William J. Simonis, Carey, O.; M. D. Muga, St. Louis, Mo.; A. B. Murphy, St. Louis, Mo.; Milton S. Gunn, Helena, Mont.; Augustus B. Brown, Portland, Me.; George A. Millay, Taunton, Mass.; J. T. Wamelinck, Cleveland, O.; Henry Fleck, Upper Sandusky, O.; president, Daniel Simpson, Helena; first vice-president, L. B. Roberts, Portland, Me.; second vice-president, Dr. G. C. Swallow, Helena; secretary, A. E. Cumming, Helena; assistant secretary, H. S. Thurber, Helena; Treasurer, L. F. La Croix, Helena; superintendent, Captain John Sheahan, Wickes, Mont.; general manager, Daniel Simpson, Helena. The company has spent some \$50,000 in developing the Eva May claim at Basin.

Phoenix Mining and Development Company.—This company has elected D. B. Vincent, president; James L. Buskett, vice-president and manager; O. S. Heyer, secretary and treasurer. The company has taken a lease and bond on the Obelisk mine at Basin, and is making arrangements to develop the mine actively.

Saturday Night.—This mine, near Basin, has been bonded by Butte parties, who agree to sink a shaft on the ledge at least 100 ft. A tunnel has already been run about 200 ft. on the vein.

Uncle Sam.—This mine, at Basin, has been developed by a 100-ft. shaft, and some drifting. At present the first-class ore is shipped to smelters and the rest dumped. When better transportation facilities are secured it is believed that the low grade ore can be worked at a profit.

Lewis and Clarke Counties.

Park Coal and Coke Company.—This company has been purchased by John Edgerton, of Helena, and with it the Muehrin coalfield adjacent to the company's property.

Silver Bow County.

The Butte "Inter-Mountain" says that it is reported that a syndicate of Canadian and New York capitalists will shortly begin active operations in Butte in developing a number of copper properties. Some time ago articles of incorporation of the Ontario Mining Company were filed in the recorder's office. This company comprises several wealthy capitalists of Toronto, and it is understood that they have joined hands with New York men and that several good properties have already been purchased here upon which development work will be commenced at once. It is understood that the Washoe mine has been secured and that a shafthouse will be erected and sinking on the east end of the claim will be commenced in about two weeks. Several of the adjoining properties have already been purchased, and one of the largest hoists in the district will be erected on the ground if properties prove as valuable as owners anticipate. Smelting works are also within the range of probability.

Lexington.—It is possible that the Lexington mine will shortly be closed down entirely for an indefinite period, says the Butte "Inter-Mountain." During the past year only a few leasers have been at work underground, and many of them, it is said

at the present price of silver, have been unable to make wages. Some years ago the shaft of this mine was developed to the 1,500 ft. level, a crosscut several hundred feet in length was run south, but no ore bodies were found. Later the pumping machinery was removed from the 1,200, 1,350 and 1,500-ft. levels and the mine was allowed to fill with water to the 800. Now the pumping machinery at the 800 level will be removed, it is said, and a smaller pump will be placed at the 600, to which level the water will be allowed to rise. This, it is said, will allow a considerable quantity of the water now being pumped from the Lexington to flow into the Alice properties, but as the Alice mine is supplied with a Cornish pump there will be no difficulty experienced in handling it.

NEVADA.

Lincoln County.

De Lamar Mining Company.—Three eight-hour shifts have been put to work in the No. 7 tunnel to drive ahead more rapidly, says the Helena "Lode." A winze was started last week some 300 ft. in the Monitor tunnel to make connection with the No. 7 level, and will be sunk about 175 ft. The road leading to the No. 2 tunnel is almost completed. The route used is from the April Fool shaft No. 1 up over the hill. The well below town has been sunk nearly 600 ft. The bottom is in a sandy clay. Several men are still employed developing the Zimmerman water in Cedar Wash, and a flow of $\frac{1}{2}$ in. has been obtained. Work in all branches by this company is moving slowly but surely, but as soon as a sufficient supply of water is obtained it will go ahead much more rapidly.

Ormsby County.

Concerning the river mills the Carson "Tribune" says: A. M. McCabe and James Spurgeon have gone to Carson Valley for the purpose of endeavoring to enter into some agreement with the ranchers, so that a sufficient supply of water may be had to operate certain mills on the river. The "Tribune" learns that there is a large quantity of ore on hand which cannot be worked owing to the lack of water. The official understanding is that the ranchers have agreed to give enough water to start the mills about September 1st.

Storey County—Comstock Lode.

The following are extracts from the latest weekly official letters of the superintendents of Comstock mining companies.

Belcher.—On the 850 level the northeast winze has been sunk to a total depth of 45 ft. The bottom shows clay and quartz. On the 1,000-ft. level the main north lateral drift is in 418 ft. From the upper levels of the mine we have hoisted 11 tons of fair-grade ore.

Consolidated California & Virginia.—In the 1,650-ft. level the faces of the ore body in the directions in which we have been carrying our stopes (south and west and upward) continue to look well, and we have extracted during the week 348 tons of ore, the average mine car sample assay of which was \$62.81 per ton. On the 1,700 level, 22 ft. below south drift No. 3, the south drift has been extended 10 ft., all the way in ore which will average \$70 per ton, and the face is in ore the average assay value of which is about \$100 per ton. Repairs to the main shaft have been completed, and the water pipe placed in position between the 1,100 and 1,500 levels. No changes are reported in the 1,000-level workings. Shipped to the Morgan mill during the week, 766 tons of ore, the average railroad car sample assay of which was \$65.71 per ton. Worked at the mill during the week 710 tons of ore, the average battery sample assay of which was \$52.44 per ton. Bullion on hand in the assay office, about \$11,000. Bullion shipped during the week to the Carson mint, \$36,201.

NORTH CAROLINA.

Lincoln County.

Monazite shipments continue to be made to the Wisenbach Electric Company, Gloucester, N. J. One car load from Ellenboro and one from Moorlsboro last week.

Montgomery County.

Maratock Mine.—Here they are taking on new life. The mine has been leased by some people who are developing and repairing the 10-stamp mill ready for operation.

Sam Christian Gold Mine.—Several tributaries have again been put to work with hand rockers and are finding some gold.

Rowan County.

(From an Occasional Correspondent.)

Some prospecting is going on in the county. Mr. S. A. Herndon, of Idaho, is here in the interest of New York capitalists. He has made several investigations of property, including the Bridget mine, in Montgomery County.

Prof. J. M. Tiernan, late geologist for the Richmond & Danville Railroad Company, has located in Salisbury and will develop a property owned by him a few miles from town.

Beam Gold Mine.—Mr. Graf, the superintendent, says: "We have struck a new body of ore and will have our mill in operation in a week. We have shipped some concentrates to the Blacksburg, S. C.,

works, and they inform us they are not in operation at present owing to a break in machinery." This will always be the case until we have a well established works in this State. Several times, to the writer's knowledge, different mines have made concentrates and gone to some expense hoping to sell them to the "new process" plants, with the same result experienced by Mr. Graf.

Reimer Gold Mine.—A new Cameron pump has just been put in, as, after unwatering the shaft, the old pumps failed to hold the water. Mr. James B. Lanier, of Salisbury, has purchased an interest in the mine and has also recently purchased a mine in Catawba County.

Stanley County.

Crawford Gold Mine.—From this mine several pounds of nugget gold has been shipped to the owner in New York.

Haithcock & Hearn Mine.—Last week a nugget weighing 47 dwts. was found. The mine consists of a large quartz vein developed to 125 ft. The nugget was found in the alluvial near the vein.

Parker Mine.—Captain Judd, manager of the Parker gold mines, now owned by the New London Estates Company, Limited, of London, has shown some very rich specimens of quartz found on the property. It is thought to be a new lode, as there are several veins on the property.

OHIO.

Stark County.

Massillon Consolidated Coal Company.—All the mines in the Massillon district, 21 in number, have been pooled and are under the control of the Massillon Consolidated Coal Company. The old companies, which form the new corporation represented at last week's meeting were as follows: Ridgeway-Burton Coal Company, Howells Mining Company, Warwick Coal Company, Elm Run Coal Company, Wheeling & Lake Erie Coal Company, Rhodes & Beidler Coal Company, Drake Coal Company, Albright Coal Company, E. G. Krause, H. P. Card, Akron Coal Company, and Ohio & Pennsylvania Coal Company. Captain J. M. Drake presided, and J. J. Phillips was the secretary. In an official statement given out after the meeting it was announced that all the operators were in favor of resuming operations without delay, with new men.

PENNSYLVANIA.

Anthracite Coal.

Advices from the coal regions report increasing trouble on account of the drouth. The Stanton, Blackman and Jersey No. 8 collieries, near Wilkes-Barre, were all obliged to shut down on September 4th owing to a shortage of water for the boilers. The Nottingham, at Plymouth, will reopen on September 10th, after two weeks shut down owing to repairs being made in the shaft. The Morea colliery was closed down on September 3d for an indefinite period, owing to a scarcity of water. The Hazel mines colliery were idle on the same date, and will be for some time for the same reason. Navigation of the Delaware & Hudson Canal, between Honesdale and the Hudson, will close until a fall of rain.

The committee of the Schuylkill Coal Exchange reports the following collieries were drawn to return prices of coal sold in August, to determine the rate of wages to be paid, and make the following returns: Bear Ridge colliery, \$2.26; St. Nicholas, \$2.37; Alaska, \$2.21; Potts, \$2.04; Mt. Hope, \$2.10. The average is thus \$2.236, and the rate of wages to be paid for labor in last half of August and first half of September is 9% below \$2.50 basis.

Humboldt.—A press dispatch from Hazleton says that fire, presumably of incendiary origin, destroyed the Humboldt colliery on September 1st. There was no fire about the building whatever, as it has not been in operation for some months. Linderman & Skeer, the operators, had been removing machinery from it, and the most valuable engines were not in the fire. The total loss to the company will be about \$10,000.

Newport Coal Company.—A press dispatch says that this company, which operates several collieries near Wilkes-Barre, has been in financial distress for some time. Operations were continued, however, until September 4th, when the colliery at Lee passed into the hands of the Lehigh & Wilkes-Barre Coal Company. The Newport company operated under a lease, and the Lehigh & Wilkes-Barre company held a mortgage on the property, which will be advertised for sale at once. It comprises about 500 acres of good anthracite coal lands. As several parties have been negotiating for the leasehold interest of the Newport company, it is expected that sufficient money will be realized from the sale to satisfy all outstanding indebtedness. Meantime the Lehigh & Wilkes-Barre company guarantees the payment of the employees for the work done in July and August.

Woodward.—This colliery of the Delaware, Lackawanna & Western has established a new record for the number of cars hoisted one day, by beating the previous one by 103 cars. The hoist made on August 31st was 1,503 cars, or 3,150 tons, which was done in 10 hours.

SOUTH DAKOTA.

Pennington County.

Keystone.—The Hot Springs "Star" says that the Keystone mine, near Hill City, has been sold to a

New York syndicate for \$250,000. The report, however, is unconfirmed as yet.

TENNESSEE.

Putnam County.

It is reported from near Cookeville that the Onstott oil well is in operation and several new wells are to be opened. There is some talk of building a refinery, but it is likely that this will not be done until the oilfield has been more fully opened.

UTAH.

Beaver County.

Horn Silver Mining Company.—The new concentrator at Frisco has been started up and is working well, says the Salt Lake "Herald." General Manager Farnsworth is now at Frisco superintending the trial runs. This plant was constructed to treat low grade ores taken from the mine in great quantities, and shipments of both rich ore and concentrates will in future be received from the mine.

Juab County.

Almo.—This group of mining claims, lying just north and west of the Bullion-Beck, has been sold to C. E. Luce, of the Provo and Tintic. The price is said to have been \$40,000. This group, which is said to be an extension of the Bullion-Beck, was located and owned until recently by Messrs. Thomas, Tucker and Kellogg, of Eureka. A 200-ft. shaft has been sunk without encountering the main ore body. The property was operated some years ago by the Almo Mining Company, under a lease and bond, but the failure of the company to strike pay rock caused it to throw up the contract. Since that time the mines have been idle.

Millard County.

Rattler.—The Rattler and Mehan groups, in Detroit districts, have been sold to St. Paul, Minn., parties.

Salt Lake County.

Shipments of ore and bullion from Salt Lake City for the week ending August 25th were: Bullion, 592,530 lbs.; silver and lead ores, 1,583,340 lbs.; copper matte, 49,840 lbs. The aggregate value of the lead and silver ores received at Salt Lake City during the week ending August 30th was \$72,250. The aggregate value of bullion shipments from the same banks was \$69,617, of which \$32,150 was in base bullion and \$5,630 in Idaho gold bars. In addition to these totals the Ontario and Daly smelters shipped up to August 25th 47,317 oz. of bullion, the value of which is not given. The shipments of Pennsylvania base bullion for the week were \$31,467; Germania bullion, \$21,000; Hanauer bullion, \$11,150.

West Mountain Placer Mining Company.—The plant of this company, at Bingham, is now in full operation, and the work of sinking the shaft to bedrock is progressing favorably. When operations were discontinued some time ago the shaft was down 70 ft., and it is estimated that not less than 60 ft. more will have to be sunk before the bedrock and the gold bearing gravel are encountered.

Tooele County.

Geyser Mining Company.—This company, at Mercur, will erect a cyanide plant of 50 tons capacity.

WASHINGTON.

Okanogan County.

Mary Anderson.—This claim, on Palmer Lake, 25 miles from Conconully, has been sold to C. Schaer, of Peoria, Ill. He has made arrangements to work the property.

Oro Group.—This group of claims, on Palmer Lake, has been sold by Messrs. Rush & Barney to St. Louis parties, who will organize a company and work the property.

Skagit County.

(From our Special Correspondent.)

The smelter at Everett, which is to start up this week, is one of the most complete on the coast. The plant contains sampling works, two O'Hara vertical roasters capable of handling over 100 tons of ore daily, and three 80 ton lead smelting blast furnaces (13 tuyers each). The plant is under the management of Mr. W. C. Bultee.

Monte Cristo.—In the early part of last week the concentrator at the Monte Cristo mines started to work for the first time. The concentrator, which was built under the direction and management of Mr. A. L. Dickerman, is specially designed for treating the arsenical gold ores which predominate in this district. The plant consists of two Blake rock crushers, one Gates rock crusher, four sets of Cornish rolls. The product of these is sized and goes to a series of jigs. The tailings from the jigs are then led to two Huntington mills where they are ground fine, passed on to fine jigs and thence to 10 true vanners. The mill is built in two sections, each capable of handling 100 tons per day. The plant is admirably arranged and the product is clean. The tramways at the mines (two Blecher's and two Halladay tramways), which were washed out by snow slides last winter, have been repaired.

Snohomish County.

The following recent locations are noted by the Monte Cristo "Mountaineer":
Coal land, 160 acres, four miles below Monte Cristo; locator, S. Lindstrom.

Little Jim mining location in Stillaguamish District; locator, A. D. Sperry.

Jessie & Turtle, Stillaguamish District; locator, H. Kennedy.

Helsingfors, Humming Bird and Knoxville, in Stillaguamish District; locator, Bartley Conroy.

Muldoon, Stillaguamish District; locator, Louis Lundine.

Coal land, 160 acres, four miles below Monte Cristo; locator, Bart Conroy.

Coal land, 160 acres, four miles below Monte Cristo; locator, Daniel McNamara.

Stevens County.

Hunter Creek District.—Much excitement is reported over this new district and many locations have been made. The district is reported to contain several well defined veins, carrying silver and copper, with some gold.

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

Slocan.

(From our Special Correspondent.)

The Grub Stake, a free milling gold claim, has been found on Caribou Creek.

The Gold Dust Company and Stayner Company expect to start sluicing this week.

The Bridge Company has started to run on the Discovery placer claim. A wing dam has been constructed and sluicing will start next week.

The mining outlook in British Columbia is improving considerably, notwithstanding fires, floods and hard times. In fact, there is probably more money being spent in legitimate mining and development than was ever spent before in this province. The class of men handling the mining property in the country has largely changed, and now men of means who only take hold of a mine to make it produce have replaced the old time boomers and speculators. At present there is less talk and more work. Camps which in the past were remarkable only for the wonderful stories told of them are now beginning to produce ore that pays good returns.

The continuity of veins and ore bodies in many of the camps has been sufficiently proved to warrant the investment of capital, and as time goes on it is found when a good investment offers capital is not wanting.

Slocan, Trail Creek, Ainsworth, Nelson, Illicillewaet, Sardeau and Boundary Creek are all working more or less extensively, while on the Thompson and Frazer rivers more work is being done than has been accomplished since the days of '56. Big Bend and East Kootenay are also being worked systematically in several places, and it must be noted that wherever work has been started under competent management, for business purely, success has been achieved.

The establishment of an experimental cyanide plant at Vancouver by the Cassell Gold Extraction Company, of England, marks another point in the mining progress in the province; as does also the news that Messrs. Vivians & Sons, of Swansea, Wales, have authorized Mr. W. Pellet-Harvey, of Vancouver and Golden, to buy any quantity or character of ores for them in British Columbia. Mr. Harvey is now taking a trip through Slocan and Nelson, where he expects to make bids on all ores.

The present freight from Nakusp to Liverpool or Swansea is \$23 a ton, but when shipments increase it is expected to reduce this rate very much. The Swansea men, it is claimed, can underbid the American smelters \$5 a ton, but it is difficult to see how this can be done with such heavy freight rates. However, it is understood that Messrs. Vivians & Sons will push the business for all it is worth.

Alamo.—This mine is owned by Capt. N. D. Moore, of Duluth. Two drifts are being run from the middle tunnel. The upraise to connect with No. 1 tunnel is up about 35 ft., and is in 20 in. of ore. The No. 1 tunnel is in 220 ft., and shows ore all the way.

News has been received in New Denver from the Customs Department at Ottawa that the new machinery for the Alamo concentrator will be admitted free of duty. This will be a precedent for future reference, and is looked on with much rejoicing by those who are likely to import mining machinery into British Columbia.

Caribou District.—The Caribou Hydraulic Mining Company, shipped a gold brick weighing 302½ oz. as a result of 47 hours' washing with an average of 2,010 in. of water.

The Horsely Mining Company also shipped a brick, weighing 287 oz., obtained in 106 hours, washing, with 921 miners' inches of water.

Consolation Placer Mine.—The wing dam on this mine is completed and by the end of the month dritting will be recommenced.

Fisher Maiden.—Twelve men are at work here. Three tunnels are being run, all of them in ore. The surface outcrop of this property is 20 ft. wide.

Golden Eagle Claim.—This claim, the first quartz claim located on Caribou Creek, is on the Government trial. The vein is 8 ft. wide and carries a small amount of quartz. Assays from the quartz have obtained \$4.81 gold.

Nelson, B. C.—It is reported that Sir Joseph Trutel, president of the Hall Mines Company, will visit Nelson with the view of looking over the company's property.

Nelson, West Kootenay.—A rich find of gold is reported 20 miles southeast of Nelson. A party of prospectors found a contact vein 30 ft. wide on the surface between dolomite and granite walls. Assays show \$10 a ton free gold.

Poorman Mine.—This property has closed down after a successful run, on account of lack of water power to run the mill.

Revelstake, West Kootenay.—A. N. Beaton, of the Vandall mine, brought in \$750 in nuggets taken from his ground.

Silver King Mine.—It is reported that a concentrator is to be erected on this property.

Slocan, B. C., Mountain Chief.—Eighteen men are employed on this property. The rise connecting No. 3 and No. 4 tunnels is completed and the mine now well ventilated. It is expected that large shipments will be made from this mine during the coming winter.

Thompson Group, Four Mile Creek.—Development on these claims has shown that as depth is attained the vein and mineral changed. On the surface the ore was chiefly galena, while as depth increased the galena grew less, until at present the vein consists entirely of dry ore similar in character to the recent find on the Fisher Maiden.

Three Forks.—The ore body recently discovered on the Idaho has been traced and stripped to the Cumberland. This property now shows 4 ft. of clean ore.

Trail Creek District.—A five stamp mill is being erected on the O. K. on Sheep Creek.

Trail Creek.—The following shipments were made from this camp during August: August 15th, 30 tons, Le Roi mine; August 18th, 40 tons, Le Roi mine; August 19th, 13½ tons, Jessie mine; August 19th, 2½ tons, May mine; August 23d, 20 tons, Jessie mine; August 23d, 40 tons, Le Roi mine.

Wakefield.—This is one of the Reid & Robertson group. The tunnel, which is in 140 ft., shows 4 ft. of high grade ore.

Yale, B. C., Prince Albert Flat Hydraulic Mining Company.—This company's property is situated three and a half miles below Yale, on the Frazer Railroad. The workings are now being carried on in a back channel; 1,500 in. of water are used and obtained from Emory Creek, and 17,000 cu. yds have been washed and have yielded satisfactory results. The pay streak on this property is 15 ft. wide.

CHINA.

Liu Ping-chang, junior guardian of the heir-apparent and Governor-General of Szechuan, states that he has received a report from the prefect of Hailichou, Szechuan, advising of the bright prospect of the lead mines newly opened in that prefecture, inasmuch as that within one year, with the crude appliances in his hands, he has been able to turn out no less than 300,000 cattie of good lead, which leads him to think that the said mines are extremely workable. The origin of the opening of these lead mines was owing to the order of the Throne, a short time ago, that all the output of the Kueichou lead mines should be sent direct to Peking; when, as a matter of fact, the coinage department of Szechuan, called the Paochuan Chü, has been entirely dependent upon the spelter and lead of Kueichou to enable it to coin the necessary number of cash for use in the Empire and province itself. The prohibition above noted compelled him to look about him nearer home for the means of supplying an important want, with the result that the lead mines of Huilichou were exploited and given a trial of one year without paying the government a royalty on mines. The prefect of Huilichou now prays that permission from the Throne be granted to allow the syndicate of merchants working the said mines to work them for three whole years, without paying any government royalty, in order to encourage the mercantile classes in enterprises of this nature.

MEXICO.

The completion of the Tehuantepec Railroad, which has been built across the isthmus of that name by the Mexican government, takes from the Panama Railroad Company the control of trade passing from the Atlantic to the Pacific. Mexico will spend \$4,000,000 in improving the terminals of the road, and as it will save 1,182 miles between New York and San Francisco it is likely that it will soon become an important revenue producer for the government. The road is 192 miles long, passing through a rough country. In constructing it the greatest care has been taken to provide the best materials and equipment which could be secured, and to this end American manufacturers have been liberally patronized. The road is of particular importance to New Orleans and other gulf ports, as it places them in reach of the Pacific in about three days' time.

(From an Occasional Correspondent.)

It is expected that in a few weeks' time the new mill will be started at the Malacate mines, Saltepec.

The water-jacket furnace will be blown in shortly after the mill has commenced running.

A scientific expedition, under government supervision, has recently ascended Popocatepetl for the purpose of taking astronomical, meteorological and other observations, and to ascertain whether it be practicable to mine the sulphur on a large scale in the crater. It is understood that the amount of sulphur is found to be practically inexhaustible, and the owner of the mountain is arranging with a well known firm's representative in Mexico City for the erection of a gravitation tramway up the side of the mountain.

A company was formed a short time ago in the City of Mexico to work El Cocktail Latino Chicago y Anexas gold mines near the city of Zacatecas. The mines, which are shallow ones, have been examined and reported on favorably by Mr. J. C. Haro, whose assays range from 4.96 silver and 0.10 gold to 7.38 silver and 6.08 gold per ton of 2,000 lbs. It is understood that work will be commenced on the mines very shortly.

A large plant on the Boss continuous system for treating the gold and silver ores of the famous El Bote mine is now in course of erection.

The Australia mine has recently sold two gold bars to the mint the result of the first clean up.

San Luis Potosi.

Guadalcazar Quicksilver Mining Company.—The production of quicksilver at the Guadalcazar mines during the four weeks ended July 26th last was 14,200 lbs., or 189½ flasks.

NEW SOUTH WALES.

The annual report of the Department of Mines and Agriculture, New South Wales, for the year 1893, recently issued, shows that the output of coal last year showed a decrease of 502,640 tons, and in value £290,666, as compared with 1892. The value of the output for last year is the lowest for 11 years past, and the average rate per ton, which was 7s. 17½d., is the lowest for the past 13 years. The lowest averages since the opening of our coalfields were 7s. 0¼d. in 1871 and 6s. 9¼d. in 1881. In 1893 the total output was 3,278,328 tons, of £1,171,722 value; 1,100,238 tons were sent to intercolonial ports, 674,852 tons to foreign ports, leaving 1,443,238 tons for home consumption. In 1892 the output was 3,780,968 tons; intercolonial exports, 1,318,608 tons; foreign exports, 873,697 tons; home consumption, 1,589,263 tons. The decrease in the home consumption is comparatively small, but the falling off in the exports to intercolonial and foreign ports has been very serious. The decrease in the home consumption is no doubt due to the depression in the various trades, and to the need for retrenchment in various directions. The decrease in the intercolonial trade is probably due to the discovery of workable coal seams in Victoria. The output of the northern collieries in 1893 was less in quantity by 408,251 tons, and in value by £222,476 10s. 2d., than the output for 1892. In the western district the decrease in quantity was 45,985 tons and in value by £14,172 19s. 3d., and in the southern district it was less in quantity by 48,403 tons and in value by £54,016 15s. 5d., than the previous year. There was a decrease in the average price per ton on the total output, the largest decrease being in the southern and south-western districts, which was 10¼d. per ton. A valuable discovery of coal was made during the year at Cremorne, Sydney Harbor, by means of the Government diamond drill, at a depth of 2,929 ft. At that depth a seam of good steam coal was struck 10 ft. 3 in. in thickness, 9 ft. 2 in. of which is workable. One important effect of this discovery is that it may now be regarded as proved that the seam in question extends from the Newcastle to the Illawarra district. The opening of a colliery on the shores of Port Jackson will probably prove an additional attraction to large ocean-going steamers, as it may afford special facilities for obtaining their coal supply. The number of collieries under inspection at the 31st December, 1893, was 97 coal and 4 shale, as compared with 101 coal and 5 shale on the same date of the previous year. The number of men actually employed in and about the coal and shale mines during 1893 was 10,413, as compared with 10,910 in 1892. The total number of fatal accidents was 13, and non-fatal 45. Of that number, 10 of the fatal and 31 of the non-fatal accidents occurred in the northern district, 2 of the fatal and 14 non-fatal accidents in the southwestern district, while in the western district there was only one accident which proved fatal. The death rate in this colony for 1892 compares very favorably with the death rate for the same year in the United Kingdom. The quantity of coke manufactured during 1893 was 5,596 tons, or more than double that of the previous year. The works of the Purified Coal and Coke Company, situated at Wallend in the northern district, made during the year 11,500 tons, and the Australian Coke Company, at Unandera, manufactured 4,351 tons. The report furnished by the Government geologist in 1892 shows that the coke made in this colony is capable of great improvement, and it is probable that the demand would be largely increased if the quality were improved.

The output of boghead mineral, or petroleum oil cannel coal, commonly called shale, during 1893 was less by 18,537 tons than during the previous year, but the average price per ton was only about 4d. per ton lower.

ONTARIO.

Mr. R. Macbray, B. A., who recently went through the Rainy Lake and Seine River country, reports the existence of several excellent gold quartz veins. They are on the mainland, especially north of Seine River and lakes. Among the prospects are the Little American and Big American on the Minnesota side; on the Canadian, the Big Canada and the Little Canada. There are good veins in the Manitou country.

SOUTH AFRICA.

Quietly for some time past careful prospecting has been done by a syndicate for the purpose of finding a good seam of coal in the vicinity of Meyerton. It had been known for years that coal existed in the neighborhood. The formation is almost similar to that of the Vaal River, where Messrs. Lewis & Marks' coal mines are. In one of the prospecting shafts, quite close to the Meyerton station, coal was struck two or three days ago at a depth of 70 ft., all the intervening strata which indicates coal in this part having been gone through in a regular manner. The width of the seam has not yet been determined, but will be known in the course of a day or so. This brings coal nearer to such companies as the Orion, Meyer and Leeb, New Black Reef, and others by as much as 13 miles, and, as the coal can be transported by rail, a very considerable saving ought to be effected shortly in the working of the companies above enumerated.

Advices from Kimberly states that a syndicate has been formed in Capetown for the purpose of working the recent nitrate discoveries in Griqualand West, and a company will be floated at once.

Mashonaland.

Our contemporary, the "Umtali Advertiser," of July 14th, contains the following items, showing what progress is being made in that new country:

Constance Reef.—This is situated on the Odzi River, 16 miles west of Umtali. Four blocks have been pegged on this reef, belonging to Messrs. Reynolds, F. Taylor, W. M. Taylor and Captain Hathorn. Six different reefs have been struck on this property, all carrying gold and their widths average from 2 ft. to 4 ft. On the Constance Reef a 30-ft. shaft has already been sunk and 2 ft. of the reef has been gone through, but the other wall has not yet been reached. A shaft is being put down on one of the reefs to the north. It is now 10 ft. Surface cuttings expose the other reefs.

Liverpool.—Mr. Tulloch, of Messrs. Bradley & Tulloch, is about to erect his battery on this property. Some good results are expected.

Panhalonga (adjoining Palmyra).—Mr. Barry has commenced a 100-ft. shaft on this property. Mr. Chase is also going to commence work on this line.

Perseverance.—Prospecting is being vigorously pushed ahead on this property.

Princess May.—Douglas is now driving for the reef at a depth of 80 ft., and it is expected to be struck any day.

Streatham.—News has reached us that Mr. Cordey has successfully floated this property and his return may be shortly expected.

LATE NEWS.

The Davis mine, at Negaunee, Mich., has completed draining and started 50 men to work at the old shaft.

Advices from Ishpeming, Mich., state that the Wheat mine on the Cascade range has been leased by Samuel Hoar, of Palmer, and operations will be resumed at once. The ore is sold to the Western Furnace Company at Manistique.

The Franklin Mining Company produced 173½ tons of mineral for August, against 175 tons for July and 180 tons for August, 1893. This makes 1,413 tons produced since January 1st, against 1,417½ tons last year, a decrease of 4½ tons.

The coke men in the southern part of the Connells-ville region near Uniontown have been creating considerable trouble, and further difficulties are feared. A deputy sheriff has a posse ready to start for the scene should it be necessary.

Mr. C. W. Hunt is traveling through Europe enjoying a rest from the duties devolving upon him as president of the C. W. Hunt Company, New York. It is understood that he intends to extend his tour through the manufacturing centers of England, France and Germany.

A press dispatch from Chattanooga, Tenn., says that 13 of the miners who cut the ropes on the incline at Whitwell coal mines have been arrested. The mines were to have resumed operations last week, but cannot now begin work until new ropes are secured, which will probably be two or three weeks.

At the recent meeting of the British Association, Professor W. C. Roberts Austin, F. R. S. (London), presented the report of the Committee on an International Standard for the Analysis of Iron and Steel. The standards will shortly be deposited with

the Board of Trade, and the work of the committee is now completed.

The Anchor Mining Company, of Park City, Utah, is adding another double jig to its concentrator. The mill will be moved from its present site to a point near the mouth of the tunnel, though the work of removal will probably not be attempted before next spring. The Daly West mine, in the same place, reports the strike of a body of good ore, running about 64 oz. silver and 35% lead to the ton.

A press dispatch from Roanoke, Va., says that business is steadily improving in the Flat Top coal region. The Peerless Coal and Coke Company will at once erect an additional bank of ovens. The Lynchburg Company is opening a new mine. The Upland Company is erecting a new tiple, crusher, revolving screen, elevators and other necessary appliances for turning out three grades of coal.

It is reported that the Seth Cook group of gold mines at Coulterville, Mariposa county, California, has been sold to a company of Boston and Montana capitalists for \$100,000. The mines have been idle for several years, owing to lack of transportation facilities. The purchasers include Thomas Cook, of Butte, Mont., and J. A. Coram, of Boston, Mass. The new owners of the Seth Cook will, it is said, erect a stamp mill and build a railroad.

The Columbia Mining Company has been organized at Seattle, Wash., and has purchased 640 acres of land opposite Yale, B. C., where it will begin hydraulic operations. It paid \$28,000 for the property. It is proposed to carry water across the Fraser River on a wire suspension bridge at a cost of \$50,000. The incorporators are Messrs. F. W. Ladd, W. H. Flett and T. O'Connor, of Merrill, Wis., and T. A. Deleg, of Seattle.

It is reported on apparently good authority that two new railroad lines will shortly be built into West Virginia to develop the mineral resources in that section. One will connect with the Baltimore & Ohio road near Point Marion, running up Cheat River 25 miles to Kingswood, where it will meet the Tunnelton, Kingwood & Fairchance narrow-gauge road. The other line will start from near Point Marion and run to Phillippi or Grafton, some 40 miles.

A company of Colorado and Eastern capitalists has taken a lease and option upon the Ivanhoe mine in the Hanover District, New Mexico. It is sinking a large well below the mine, and if a sufficient supply of water can be developed a large smelting plant will be erected and the mine worked to its full capacity. The ore body in the mine is said to be over 20 ft. wide, and averages, according to the Silver City "Enterprise," 20% copper and about \$8 per ton in gold and silver.

At the Confidence mine in Mogollon, New Mexico, 10 men are employed making upraises from the adit level and blocking out the ore bodies ready for extraction as soon as the mill shall start. There will be an accumulation of 3,000 tons of ore on hand at the mine and in the bins at the mill by the time the stamps are ready to drop. Work on the mill has been retarded by delays in delivery of machinery. The mill will probably be completed about October 1st.

The "Daily Inter-Mountain," of Butte, Mont., says: The Broadwater mine at Nelhart is not shipping its regular amount of ore at present, owing to the commencement recently of a new tunnel, the driving of which requires a good-sized force of men. The mine is now operated by about 125 miners, which number will be materially increased when the new tunnel reaches the ore. Air drills are used in the construction of this tunnel, known as No. 3, and after about one month it will reach the ore. Stopes will at once be opened, and it is intended at that time to ship more ore than at any previous time.

The Diamond Drill Works, at Birdsboro, Pa., which were closed by the sheriff several weeks ago on executions aggregating \$132,000, were sold on September 6th by Sheriff Farenbach for \$47,725. The labor claims, which amounted to about \$4,000, will be paid out of this amount. It is reported from Reading, Pa., that George Brooke, Jr., George W. Harrison and W. H. Hacker, a committee representing the execution creditors, will reorganize the company at once, and operations will be resumed next week under the name of the Diamond Drill Manufacturing Company.

The output of the Michigan copper companies so far reported are as follows: The Quincy mine produced 800½ tons of mineral for August, against 800½ tons for July and 724 tons for August, 1893. This makes 6,161 tons produced since January 1st, against 5,602 tons last year, an increase of 559 tons. The Wolverine mine's product for August was 83½ tons, against 80½ tons for July, making 681½ tons since January 1st.

A Boston "News Bureau" special says Calumet & Hecla produced 5,600 tons of mineral in August, against 5,300 tons in July.

Advices from Belt, Mont., state that the coal strike there is over, the miners having agreed to return to work on the following terms:

1. The company will pay 95c. a car for coal mined, instead of 90c. as heretofore, and the coal must be clean.

2. The company will lay all rails except one short pair rails at end of chambers, and deliver all timbers to the men at the entrance of chambers where they work.

3. The company are to put in scales as soon as possible and thereafter all coal mined will be weighed and paid for at the rate of 75c. per ton of 2,000 lbs.

4. The Trades Council of Great Falls binds itself to guarantee that the Belt employes will give 60 days' notice before they demand any change in the terms of agreement, and if they violate this provision the Trades Council will sever all relations with the Belt union which may exist at the time; and guarantee further to furnish the management with skilled men to take the places of such parties as violate the agreement.

A press dispatch from Uniontown, Pa., says that the prosecution against the deputy sheriff who were placed under bail charged with murder for having killed strikers in riots during the coke strike have all proved fruitless and shed a clearer light on the rights and duties of these officers. Deputy Mat Allen and five others, who shot and killed two Slavs at Lemont in July while searching for kidnapped workmen, were cleared, the grand jury ignoring the bills. James Stanley, who shot and killed a Slav on the street in Connellsville in June while being mobbed by a crowd of strikers because he was a deputy and alone, and shot to save his life, was also cleared by the grand jury. Charles Hatfield, of Connellsville, who was charged with shooting and killing a Slav, while he and other deputies were pursuing the mob that killed Chief Engineer Paddock last April, was placed on trial this week. The case was given to the jury on September 5th, and in a few minutes they found a verdict of acquittal without leaving their seats. The court's charge to the grand jury was to the effect that the strikers took their lives in their own hands when they resisted arrest or attacked deputy sheriffs or interfered in the discharge of their duties, and it was the duty of the deputies to shoot when it became necessary.

The following are extracts from the latest weekly official letters of the superintendents of Comstock mining companies:

Savage.—On the 1,100 level in the north lateral drift, started from the east drift, we continue to extract ore on the sill floor and are putting in square sets on second floor. On the 1,050 level the west crosscut from the sixth floor of the south ore stopes was advanced to a total length of 95 ft.; face in porphyry. The east prospecting drifts from the 10th and 11th floors of these ore stopes are each advanced 47 and 23 ft., respectively. These drifts are in quartz and porphyry. The last prospecting drift from the fourth floor was advanced 50 ft., when it reached the east clay wall and was discontinued. On the 1,100 level the north lateral drift from the station was advanced to a total length of 297 ft.; face in quartz and porphyry, giving low assays. The west crosscut started 20 ft. back from the face of this drift was advanced to a total length of 41 ft.; face in porphyry. During the week we have hoisted 62 cars of ore from the 1,000 level. Car samples average \$22 per ton.

Belcher.—On the 850 level the northeast winze has been sunk to a total depth of 45 ft. The bottom shows clay and quartz. On the 1,000 level the main north lateral drift has been cleaned out and repaired, making its total distance 418 ft. from the incline station. From the upper levels of the mine we have hoisted during the week 11 tons of fair-grade ore.

A meeting of the stockholders of the Chapin Mining Company was held recently in Milwaukee, the object being, as stated by Attorney Flannigan, representing the bondholders as trustee, to consider the question of foreclosing the second mortgage on the property, which amounts to about \$700,000. Some months ago nearly 50,000 shares of the mining stock were sold by the Wisconsin Fire and Marine Insurance Company Bank to satisfy a claim of \$96,000, held as a part of a first mortgage for \$150,000. The stock was bought in by unknown parties, presumably by Cleveland men, headed by M. A. Hanna, at \$1 per share. Since that time the bank has received its full claim of \$96,000, with interest, and is entirely out of the deal. The second-mortgage bondholders now desire to take the best possible steps looking to a satisfactory settlement of their united claims, amounting to nearly \$700,000. At the meeting the matter was fully considered, and it was decided to foreclose, as a suit for foreclosure had been commenced. If this mortgage is foreclosed, the mining property, including the lease, machinery, tools, etc., will be offered at public sale some time before the 15th. Mr. Flannigan, the trustee, recently made a report of the financial condition of the property, showing that on August 10th, 1893, the Chapin Mining Company made a mortgage of its property to secure the payment of its bonds, aggregating the sum of \$1,038,000, divided into three classes, \$200,000 of the first, \$538,000 of the second, and \$300,000 of the third class. All but the bonds of the third class have been disposed of. About

Old Rails.—The movement in old iron rails continues at \$11.50.

Scrap.—Heavy steel \$11; light \$8; No. 1 wrought, \$10.50; machinery cast, \$9.50.

Pittsburg. Sept. 6. (From our Special Correspondent.)

Raw Iron and Steel.—The general features of the market show but little change. The stock of certain kinds of iron and steel being limited, buyers are under the necessity of confining their purchases to limited amounts; prices are fairly maintained. As compared with a month or two ago the present condition of the trade at the leading trade centers is far more satisfactory, particularly as regards the volume of business.

Pig iron retains its firmness in a manner that encourages the furnace men to look for better prices than are now being realized. In some instances holders are higher in their views, but consumers seem to have little difficulty in securing the material they require.

COKE SMELTED LAKE AND NATIVE ORE. Tons, Bessemer, Cash. 5,000 Sept. 6, \$11.75. 3,000 Bessemer, Sept. 6, 11.60. 2,000 Bessemer, Sept. 6, 11.70.

SKELP IRON. 450 Sheared iron, 1'10 1/4 m'. 360 Wide gr' ved. 1'30 1/4 m'. 280 Nar. gr' ved. 1'30 1/4 m'.

SKELP STEEL. 500 Sheared iron, 1'25 1/4 m'. 450 Wide gr' ved. 1'10 1/4 m'. 375 Nar' w gr' v'd. 1'10 1/4 m'.

SPELTER. 75 Western, 3.35. FERRO-MANGANESE. 100 80% Delivered, 51.60. STEEL SHEET BARS. 600 September, 23.00.

BLOOMS, BILLETS AND SLABS. 1,500 Billets, next four months at mill, \$17.75. 1,000 Billets, Sept., at mill, 17.65.

AUGUST SALES BESSEMER AND BILLETS.

The last column, the total sales of raw material for the month, showing an increase over the previous month in the totals 15,475 tons.

Table with 4 columns: Bessemer, Billets and slabs, Raw material, and a date column (Aug. 3, 10, 17, 24, 31). Rows show tons and values.

THREE YEARS' PRICES STEEL BILLETS.

Transactions as usual show a wide range of prices. The decline from 1892 to 1894 shows a large margin; the highest being \$25 per ton f. o. b. maker's mill, the lowest in 1894 being \$17.25.

Table with 4 columns: 1892, 1893, 1894, and a date column (Aug. 3, 10, 17, 24, 31). Rows show prices per ton.

BESSEMER FIG.

The following are the cash prices, giving the highest and lowest prices for each week, the highest in all cases being for prompt delivery:

Table with 4 columns: 1892, 1893, 1894, and a date column (Aug. 4, 11, 18, 25, 31). Rows show prices for Bessemer iron.

AUGUST TOTAL SALES.

Made weekly during August for the past three years. Those of the present year exceed all previous ones, which goes to show that Pittsburg is the great iron and steel center:

Table with 4 columns: 1892, 1893, 1894, and a date column (Aug. 3, 10, 17, 24, 31). Rows show total sales.

Cartagena, Spain.

(Special Correspondence.)

Stocks of Cartagena and Portman iron and manganese ores, held by Messrs. Barrington & Holt for September, are as follows:

Table with 3 columns: Class of ore, Tons for shipment, Price f. o. b. Rows include Ordinary 50% Portman, Special low phosphorous, Extra quality, etc.

Iron and Manganiferous Ores.—The position in this district remains much the same as reported for some time past, although there has been some slight improvement in the shipments of manganiferous ores.

METAL MARKET.

NEW YORK, Friday Evening, Sept. 7, 1894.

Gold and Silver.

Prices of Silver per ounce Troy.

Table with 4 columns: September, St. Ex., London Pence, N. Y. Cts., Value of sil. in \$1. Rows show silver prices for Sept 1, 3, 5, 7.

* Holiday.

The demand for the East continues good. Supplies are going to China and India chiefly. The Japan mint at the latest advices was rather full of uncoined bullion, and the inquiry for that quarter does not cut as much of a figure as some months ago.

The United States Assay Office at New York reports the total receipts of silver for the week to be 137,009 oz.

Gold and Silver Exports and Imports at New York, Week Ending September 1st, 1894, and for Years from January 1st, 1894, 1893, 1892.

Table with 5 columns: Gold Exports, Gold Imports, Silver Exports, Silver Imports, Total excess, Exp. or Imp. Rows show weekly and yearly data.

During the five days ending September 6th the imports and exports of gold and silver from the port of New York were as follows: Imports, gold, \$5,593; silver, \$61,692. Exports, gold, \$557,000; silver, \$395,900.

Gold and Silver Exports and Imports of the United States, at all Ports, for July, 1894, and for Seven Months to July 31st, 1894, 1893.

Table with 5 columns: Gold Exports, Gold Imports, Silver Exports, Silver Imports, Total excess, Exp. or Imp. Rows show monthly and yearly data.

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

NOTES OF THE WEEK.

Our market reports show that there are marked signs of an improvement in the iron and steel trade, though more particularly, for the present, in pig iron. Consumption is increasing steadily and prices are strong and advancing.

The Governors of the Bank of England at their weekly meeting on Thursday made no change in its minimum rate of discount, which remains at 2%. In the week the bank lost £72,221 bullion, but the proportion of reserve to liability was raised from 70.03 to 70.26% against an advance from 48.25 to 51.37% in the corresponding week last year.

Table with 4 columns: 1894, 1893, 1892, and a date column. Rows show gold holdings, silver holdings, notes in circulation, etc.

The bank's gold holdings now compare as follows with the same date one and two years ago:

Table with 4 columns: 1894, 1893, 1892, and a date column. Rows show gold holdings, silver holdings, notes in circulation, etc.

The bank's sterling holdings of gold and silver compare as follows with the same date one and two years ago:

Table with 4 columns: 1894, 1893, 1892, and a date column. Rows show gold, silver.

Customs receipts on Thursday were \$806,185; internal revenue, \$250,622; miscellaneous, \$81,066. National bank notes for redemption, \$137,310. Total national bank notes held for redemption, \$5,317,289.

Exports of silver from London to the East for the year up to August 24th are given by Messrs. Pixley & Abell's circular as below:

Table with 4 columns: 1893, 1894, Changes, and a date column. Rows show India, China, The Straits, etc.

Shipments for the week ending August 24th were £134,200 to Bombay.

The statement of the United States Treasury on Thursday, September 6th, shows balances in excess of outstanding certificates as below, comparison being made with the corresponding day of last week:

Table with 4 columns: Aug. 30, Sept. 6, Changes, and a date column. Rows show Gold, Silver, Treasury tenders, Legal notes, etc.

Total, \$119,943,100. Government deposits with national banks on September 6th amounted to \$10,959,635, a decrease of \$2,804,747 during the week.

The revenues and expenditures of the Treasury for August and for the fiscal year to date were as follows:

Table with 3 columns: Receipts, Expenditures, Surplus. Rows include Month and Year to date.

The sources and amount of receipts for August were: From customs, \$11,804,914; internal revenue, \$27,562,278; miscellaneous, \$1,950,412. While the receipts in August were abnormally large, the expenditures, owing largely to the fact that but little interest on the debt was paid in that month and much in July, were \$5,000,000 less than in July.

The annual forest fire in the Northwest has this year been more than usually ghastly in its terrible destruction of life and property. Some 14 small towns in the district have been completely wiped out of existence, and it will never be known how many lives have been lost.

The San Francisco, Cal., "Daily Report" August 28th says: The steamer China, leaving this port today for China and Japan, carries the largest amount of treasure, nearly all silver, shipped in a long time.

The coinage of the United States mint during the month of August, 1894, was as follows: Double eagles, 113,000, value \$2,260,000; eagles, 546,200, value \$5,462,000.

The differences between the receivers of the Reading Railroad Company are in a fair way to be adjusted, and a plan is being prepared which, if carried out, will result in the speedy rehabilitation of that company.

The report of the cotton crops of 1893-94 has been issued by Secretary Hester, of the New Orleans Cotton Exchange, shows the crop to be 7,549,817 bales, as against 6,700,335 bales last year and 7,035,379 bales the year before.

The circulation statement issued by the Treasury shows that during the past month the amount of money in circulation decreased \$10,902,758, making the total circulation September 1st \$1,646,671,481, or \$23.29 per capita.

The Hungarian Minister of Agriculture has published his annual estimate of the wheat crop of the world. According to this estimate the wheat crop of the world will be 2,476,000,000 bushels for 1894, against 2,279,000,000 bushels for 1893 and 2,280,000,000 bushels, the official average for the last decade.

The detailed figures representing the production

and deficit of the various importing countries for the year 1894 are as follows:

Table with 3 columns: Country, Production (Bushels), Deficit (Bushels). Rows include Great Britain, France, Germany, Italy, Holland, Switzerland, Belgium, Denmark, Sweden and Norway, Spain, Portugal, Greece, Austria.

The figures in detail of the production and surplus of exporting countries are these:

Table with 3 columns: Country, Production (Bushels), Surplus (Bushels). Rows include Russia, Hungary, Rumania, Turkey, Bulgaria, Serbia, United States, Canada, India, The rest of Asia, Africa, Australia, Chile, Argentine Republic.

The Imperial Bank of Germany reports its present holdings of gold and silver as £48,777,000, as against £40,186,000 in 1893 and £47,931,000 in 1892.

Table with 3 columns: Item, Dec. 1893, Dec. 1892. Rows include Gold and silver coin and bullion, Notes in circulation, Treasury notes held, Other securities.

Commenting upon the new circular of the Treasury which cancels the former order enabling banks to send small notes to their correspondents, at Government express rates, by depositing gold at the sub-treasuries, a member of the Clearing House Committee says: "This is just what any sensible man might have expected to be done."

The English papers note a better feeling in the British iron trade, and accompanying it a slight improvement in demand and advance in prices. The demand for home consumption has increased, particularly in the north of England.

Domestic and Foreign Coins.

The following are the latest market quotations for the leading foreign coins:

Table with 3 columns: Coin, Bid, Asked. Rows include Mexican dollars, Peruvian soles and Chilean pesos, Victoria sovereigns, Twenty francs, Twenty marks, Spanish 25 penetas.

Other Metals.

Copper is a little less buoyant than when we last went to press; not that much lower prices are ruling, but the demand is not quite so brisk as it then was. Many of the larger consumers have bought quite freely, and, being covered for a reasonable time to come, they are now awaiting the development of affairs, and, with the likelihood of an increased volume of business in the future, will probably before very long again be in the market.

Lake copper can be bought at 92@94, and is, if anything, somewhat firmer than it was last week, as the demand for this description has improved as has also electrolytic, which must be quoted the same as lake.

Casting copper is somewhat easier, and must be quoted 87 1/2@9c.

The European market shows no improvement from last week, prices having declined to £39 17s. 6d. for spot and £40 7s. 6d. for three months. Refined sorts are unchanged.

There is as yet no increase noticeable in the number of orders placed by foreigners for American copper, and there is not likely to be, as the prices here are almost £1 above those at which European copper is offered for sale.

Statistics for the last half of August show an increase of 1,400 tons.

Copper Exports.—The exports of copper from the port of New York during the week ending September 7th, as reported by the New York Metal Exchange, were as follows:

Table with 3 columns: Location, Quantity, Unit. Rows include St. Petersburg-Martello, Swansea-Wels City, Glasgow-State of California, Trieste-Powhattan, Liverpool-Cevic, Glasgow-Olympia, Marseilles-Britannia, Swansea-Exeter City, Liverpool-Britannia, Antwerp-Noordland.

Exports of copper from Baltimore for the week ending August 31st are reported by our special correspondent as follows:

Table with 3 columns: Location, Quantity, Unit. Rows include Hamburg-Bremen, Hamburg-Bohemia, Rotterdam-Venango, Havre-Bretwaloo.

Other metals exported during the week were: 1,121 bundles tin scrap, 241,349 lbs., to Rotterdam; 187 barrels sulphate of copper, 112,200 lbs., to Hamburg; 797 bundles tin scrap, 56,009 lbs., and 38 barrels sulphate of copper, 23,800 lbs., to Antwerp.

Exports of copper from Baltimore for the week ending September 6th are reported by our special correspondent as follows:

Table with 3 columns: Location, Quantity, Unit. Rows include Bremen-Dresden, Hamburg-Hungaria, Rotterdam-Urbino, Havre-Bretwaloo.

Other metals exported during the week were: 900 plates spelter, 45,616 lbs., 9 tcs. and 151 barrels zinc dross, 112,506 lbs., 29 barrels and 24 bags zinc skimmings, 23,600 lbs., and 374 bundles black plate shearing, 47,330 lbs., to London; 186 bundles tin scrap, 50,212 lbs., to Rotterdam.

Tin has been very active, large business having been transacted at prices as high as 16 1/4@16 3/4, but at the close values show a decline as the result of lower quotations from abroad.

The foreign market advanced steadily during the early part of the week, and reached its highest on Wednesday, when the quotations were marked up to £73 15s. for spot and £73 for three months, from which there has been a decline to £71 15s., this being the closing figure for the week.

The syndicate, which is operating for an advance and practically controlling the entire available supplies, seems to have matters pretty well its own way; such at least would appear from the tactics employed by its opponents, who are cautioning consumers against buying, their object being, of course, to bring about lower values so as to cover at lower prices what they evidently—in their efforts to frustrate the operations of the syndicate—have sold short.

Lead.—The market is in a demoralized condition; prices have been marked down from day to day, and consumers have been unwilling to place any orders, evidently fearing that this state of affairs will continue for some time to come.

The foreign market remains unchanged at £9 18s. 9d. for Spanish, and £19 1s. 3d. for English.

St. Louis Lead Market.—The John Wahl Commission Company telegraph us as follows: Since our last report market in general has weakened a little in price. Spot lead has been in pretty fair demand at 35@37 1/2c., sales for late September at 3c., and some sales for October as low as 29 1/2c.

Spelter shows some improvement; consumers have been buying a little more freely, and prices have advanced to 320 at St. Louis and 345 in New York. In view, however, of the very heavy output, all the smelters operating to their fullest extent, it

NEW YORK MINING STOCK QUOTATIONS.

Table with columns for 'DIVIDEND-PAYING MINES' and 'NON-DIVIDEND-PAYING MINES'. Each section lists company names and stock prices for Sept. 1 through Sept. 7, along with sales figures.

*Ex-dividend. †Called at New York Stock Exchange. ‡Assessment paid. §Assessment unpaid. D... 1,935... Total shares sold, 3,205.

BOSTON MINING STOCK QUOTATIONS.

Table with columns for 'NAME OF COMPANY' and 'SALES' for various mining companies in Boston, with prices listed for Aug. 31, Sept. 1, 3, 4, 5, 6, and 7.

Dividend shares sold, 703. Non-dividend shares sold, 2,910. Total shares sold, 2,713.

COAL AND COAL RAILROAD STOCKS.

Table listing coal and coal railroad stocks with columns for 'NAME OF STOCKS', 'SALES', and prices for Sept. 1 through Sept. 7.

Total shares sold, 49,333.

INDUSTRIAL AND TRUST STOCKS.

Table listing industrial and trust stocks with columns for 'NAME OF STOCKS', 'SALES', and prices for Sept. 1 through Sept. 7.

Total shares sold, 379,394.

COLORADO.

Table listing Colorado stocks with columns for 'NAME OF COMPANY', 'SALES', and prices for Sept. 1 through Sept. 7.

Total shares sold, 173,200.

MARYLAND.

Table listing Maryland stocks with columns for 'NAME OF COMPANY', 'SALES', and prices for Sept. 7.

PENNSYLVANIA.

Table listing Pennsylvania stocks with columns for 'NAME OF COMPANY', 'SALES', and prices for Sept. 7.

UTAH.

Table listing Utah stocks with columns for 'NAME OF COMPANY', 'SALES', and prices for Sept. 1 through Sept. 7.

CALIFORNIA.

Table listing California stocks with columns for 'NAME OF STOCKS', 'SALES', and prices for Aug. 31, Sept. 1, 3, 4, 5, 6, and 7.

FOREIGN.

Table listing foreign stocks with columns for 'NAME OF STOCKS', 'BUYER', 'SELLER', and prices for Aug. 30, 1894.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns: Name and Location of Company, Capital Stock, Shares, Par, Assessments, Dividends, Date and amount of last, Total paid, Date & amount of last, Name and Location of Company, Capital Stock, Shares, Par, Assessments, Date and am. of last.

G., Gold, S., Silver, L., Lead, C., Copper, B., Borax. * Non-assessable. † The Deadwood previously paid \$375,000 in eleven dividends and the Terra \$75,000. ‡ Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends, and the Cons. Virginia \$12,390,000. § Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends. ¶ Previous to this company's acquiring Northern Belle, that mine paid \$3,000,000 in dividends against \$425,000 in assessments.

COLORADO. Aspen.

Table of Aspen prices including Argentum-Juniana, Aspen Contact, Aspen Deep Mining, Best Friend, etc.

Colorado Springs, Aug. 31.

Table of Colorado Springs prices including Cripple Crk (gold), Alamo, Anaconda Gold, Anchovia Leland, etc.

PENNSYLVANIA.

Pittsburg. Sept. 5.

Table of Pennsylvania prices including Allegheny County Light, Bridgewater Gas, Chartiers Hook Coal, etc.

MISSOURI.

St. Louis. Sept. 4.

Table of Missouri prices including Closing quotations, Adams, American & Nettie, etc.

MONTANA.

Helena. Aug. 30.

Table of Montana prices including Bald Butte (Mont), Benton Group, Combination, etc.

MINNESOTA.

Duluth. Sept. 4.

Table of Minnesota prices including Biwabik M. Iron Co, Cincinnati Iron Co, Clark Iron Co, etc.

UNLISTED STOCKS.

Table of Unlisted Stocks including Adams Iron Co, Ashland Iron Co, Buckeye Iron Co, etc.

FOREIGN.

Table of Foreign prices including Shanghai, China, Aug. 3, Hong Kong Electric Co, etc.

Paris, France. Aug. 27.

Table of Paris prices including Acieries de Creusot, de Firmsy, Fives-Lille, etc.

ASSESSMENTS.

Table of Assessments including COMPANY, No., Dngt. office, Day of sale, Amt. in per sh'rs.

CURRENT PRICES.

These quotations are for wholesale lots in New York unless otherwise specified. Acid-Acetic, chem. pure... 17.19. Commercial, in bbls. and cys. 0.19@0.12.

Cadmium Iodide - lb... \$5.50. Ordinary rock... 0.14. Ground, 0.24. Naphtha-Black... 0.12. Nitre Cake - ton... \$10.00.

Mineral Wool-Ordinary slag... 0.14. Ordinary rock... 0.24. Ground, 0.24. Naphtha-Black... 0.12.

Tin-Crystals, in kegs or bbls... 14.15. Muriate, single feathered or flossed... 0.20. Double or strong, 64° B... 10.15.

RAILROAD MATTERS.

The Baltimore & Ohio has begun the excavations for a passenger station at Harper's Ferry, W. Va.

The reorganization committee of the Choctaw Coal and Railway Company has decided to change the corporate name of the company to that of the Choctaw, Oklahoma & Gulf Coal and Railway Company.

It is proposed by London parties to build the Birmingham, Sheffield & Tennessee River Railroad from its present terminus to Little Shoals, on the Warrior River. A party is now out surveying for the extension.

Mr. E. D. Smith, assistant general passenger agent of the Baltimore & Ohio road, has completed his 25th year of service with that company. He began service with the company in 1869 as clerk in the ticket department.

Mr. C. H. Hudson has been appointed General Manager and Col. C. P. Minetree has been appointed Purchasing Agent of the Memphis & Charleston Railroad. Both officers have their headquarters at Washington, D. C.

The Colorado Coal and Iron Company has just closed an order for 12,000 tons of steel rails for the Choctaw Coal and Railway Company, of the Indian Territory. The works of the company at Bessemer are now running at full capacity.

W. T. Sprague having resigned as superintendent of the Mexico, Cuernavaca & Pacific, that office has been abolished, and the duties will be performed by the general manager, D. B. Smith, whose headquarters are at the City of Mexico.

The Atlantic Coast Line announces the completion of a new route from Sunter, S. C., to Denmark, S. C., connecting at latter place with South Carolina Railroad, making this a short and quick line to Augusta, Macon and all middle Georgia points.

The Supreme Court of Georgia has ordered the sale of the Georgia Southern & Florida Railroad. There has been a strong fight on this case between the Macon Construction Company, which built the road, and the bondholders, represented by the Mercantile Trust Company of Baltimore.

The Committee of the New York State Constitutional Convention has reported adversely the amendment authorizing the expenditure of \$20,000,000 on canal improvement. The ground taken by the committee is that it is an affair for legislation and not for constitutional amendment.

Mr. W. R. Crumpton, who has been General Manager of the Baltimore & Lehigh Railroad since 1891, has resigned that position the railroad being now operated by Mr. Alexander Brown, of Baltimore, as the representative of the bondholders' committee, which now controls the property.

The following appointments were made last week by General Manager Hays, of the Wabash: Mr. C. S. Crane, to be general passenger and ticket agent, vice Mr. F. Chandler, deceased; H. V. P. Taylor to be assistant general passenger ticket agent, vice C. S. Crane, promoted, with offices at St. Louis.

Mr. Bissell Wilson, Southern traveling agent of the Missouri Pacific, has been transferred to Chicago as district passenger agent, succeeding Mr. John E. Ennis, who goes into the law department of the company. Mr. Wilson is succeeded at Louisville by Mr. R. G. T. Matthews, who has been traveling passenger agent at that town for the St. Louis Southwestern Railroad.

The Southern Railway Company has appointed Mr. G. N. Ross superintendent of the sixth division, which will consist of the following roads: The old Georgia Pacific, from Birmingham to Greenville, Miss.; Blocton & Birmingham, from Birmingham to Montevallo; the old East Tennessee's Alabama division from Rome, Ga., to Meridian, Miss., and the line from Selma to Akron—all 808 miles.

The Baltimore & Eastern Shore Railroad was sold at auction on the 29th ultimo for \$400,000. The road was bought in the interest of the reorganization committee of the bondholders. As soon as the court ratifies the sale the consolidation of the Maryland, the Choptank and the Eastern Shore steamboat companies with the railroad company will be consummated, thus monopolizing freight and passage traffic between Baltimore and the Eastern Shore counties of the State.

The Northwestern Elevated Railroad Company of Chicago has submitted to the War Department the plans for its bridge across the river at Wells street. The plans provide for a lift bridge on the same principle as the one constructed at Halsted street. The span is much longer, however, and has to be raised to the same height. The towers on each side of the river will be upward of 200 ft. high, and the bridge must be raised to clear 150 ft. above the water for the passage of vessels. The span is to be 260 ft. long.

Mr. Charles L. Wellington, who was appointed general freight agent of the Wisconsin Central a few months ago when the company assumed the operation of its lines after the abrogation of the lease with the Northern Pacific, has been appointed traffic manager of the company; and Mr. John C. McKinnon, who has been secretary of the Milwaukee Merchants' and Manufacturers' Association, becomes general freight agent in Mr. Wellington's place. Mr. Wellington was formerly general freight agent of the Milwaukee, Lake Shore & Western for about five years until the lease to the Chicago & Northwestern.

Mr. P. P. Shelby, who for the past year has been general manager of the Pacific Coast lines of the Great Northern Railroad, which includes the Seattle & Montana and the Fair Haven & Southern, operating about 160 miles of road, has had his title changed to assistant general traffic manager, his office remaining at Seattle, Wash. Mr. Shelby was transferred to Seattle as general manager of the Seattle & Montana and Fair Haven & Southern railroads in 1892, before those lines had been formally added to the Great Northern Railroad. He was previously for about two years general traffic manager of the Great Northern Railroad, having risen to that office from that of assistant general traffic manager.



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Rich mineral lands are cheap; excellent water powers, manufacturing sites, business locations, etc., are numerous. The people are hospitable and extend a warm welcome to newcomers. The climate is unequalled, no severe storms or cyclones, no contagious diseases.

Half-rate excursions from Chicago and the West to the Shenandoah Valley on September 4th and 18th, October 2d, November 6th and December 4th.

Further information free. Address M. V. Richards, Land and Immigration Agent, B. & O. R. R., Baltimore, Md.

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This company is engaged in the business of buying and selling, developing and operating mines. It is at the present time occupied in developing and equipping for production at an early date several groups of gold mines, situated in Idaho and Montana, of which it is the owner.

Thus prominently established in the mining regions, it has occasional opportunities for securing valuable mines at prices much lower than are possible under the usual methods of bringing such property to the attention of investors.

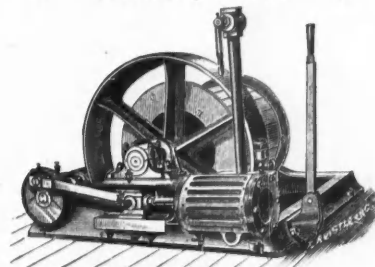
It has in its employ mining engineers whose reports it will guarantee, and desires to act as the Western agent of individuals or syndicates in the selection and purchase of mining property, doing the work on a commission. It will also advise on the operation of such, or other property of this class.

The company is in a position to properly guarantee any statement or report made by it, and solicits work of the character described, confident that with its exceptional facilities it can render valuable service to non-resident mine owners and investors.

It will furnish, upon proper application, evidences of its local reputation and of the character of its business transactions.

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The **Its Statistics,**
Technology
Mineral **and Trade**
Industry : **IN THE UNITED STATES**
AND OTHER COUNTRIES
From the Earliest Times to the Close of 1893.

VOL. II. ANNUAL.

This great volume of more than 1,000 octavo pages is the most important contribution to the statistics of the mineral industry of the world that has ever been published. **This is the only work published in any language that gives the Statistics of the Mineral Industry of the World, and the only work that gives the Statistics of the United States for 1893.**

It treats of abrasive materials; alum; aluminum; antimony; arsenic; asbestos; asphaltum; barytes; bauxite; bismuth; borax; bromine; cadmium; cements; the chemical industry, with the latest electrolytic and other processes applied in America and Europe; chrome iron ore and its products; clay and the clay industry; coal, with graphical tables of production, consumption per capita, production per man employed, costs, markets, coal mining machines and their work; copper production, consumption, markets, improvements in copper metallurgy, all the electrolytic refining processes, present practice in copper concentration and extraction throughout the world; copperas; cryolite; feldspar; fluorspar; gold and silver; graphite; gypsum; iron and steel; advances made in iron and steel metallurgy; open-hearth work at Steelton, Pa.; lead, distribution and production of lead in all countries; recent improvements in the treatment of argentiferous lead ores; limestones, marble and lime; lithographic limestone; magnesite; magnesium; manganese; marls; mica; nickel; onyx; ozokerite; peat; petroleum, its production, refining, markets, etc.; phosphate rock; phosphorus; precious stones; pyrites; quicksilver; the rare elements, their occurrence and production barium, boron, calcium, caesium, cerium, chromium, columbium, didymium, erbium, gallium, germanium, glucinum, indium, lanthanum, lithium, manganese, molybdenum, osmium, palladium, potassium, rhodium, rubidium, ruthenium, scandium, selenium, silicon, strontium, tantalum, tellurium, thallium, thorium, titanium, uranium, vanadium, ytterbium, yttrium, zirconium; salt, slate; sodium; sulphur; talc and soapstone; tin; tungsten; whetstones; scythe stones and grindstones; zinc.

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ALPHABETICAL INDEX TO ADVERTISERS.

(-) Indicates every other week or monthly advertisements.

Table with 3 columns: Advertiser Name, Page Number, and Advertiser Name. Columns are labeled A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y. Includes entries like 'Abbott, Wheelock & Co.', 'Corcoran Scientific School', 'Jones & Jones', 'Pennsylvania Military College', etc.

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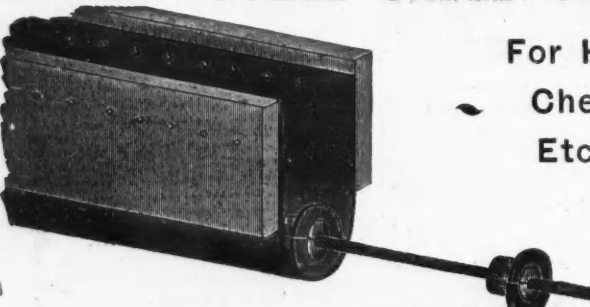
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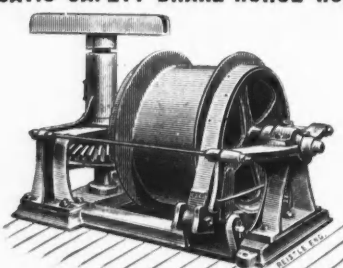
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Inquiries from employers in want of Superintendents, Engineers, Metallurgists, Chemists, Mine or Furnace Foremen, or other assistance of this character, will be inserted in this column WITHOUT CHARGE, whether subscribers or not.

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

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1353 WANTED—A MILL MAN THAT HAS had experience in treating low grade ores by concentration and the tailings by any of the successful modes now in use. Address TAILINGS, ENGINEERING AND MINING JOURNAL.

1354 WANTED A GOOD INSTRUMENT man for an extended survey. State age and experience. Address INSTRUMENT, ENGINEERING AND MINING JOURNAL.

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

METALLURGIST AND CHEMIST OF eight years' experience as assistant superintendent, superintendent and consulting metallurgist of lead refining, lead concentrating, pyritic smelting, copper smelting and copper refining works, will be at liberty shortly to take new position. Familiar with the latest metallurgical processes and improvements in the winning of metals from their ores, and the treatment of furnace and mill products. Terms reasonable. Address SMELTING AND REFINING, ENGINEERING AND MINING JOURNAL. No. 16,831 ff.

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A GRADUATE IN CHEMISTRY FROM THE University of Virginia, and post-graduate from the Ohio State University, desires position as chemist. Experienced in general analytical work, metallurgical and agricultural chemistry. Good references. Address "A. W.," ENGINEERING AND MINING JOURNAL. No. 16,842, Sept. 15.

GRADUATE MECHANICAL ENGINEER and draftsman, Jr. member American Society Mechanical Engineers, is open to engagement. Experience in rolling mill, mining and general machinery. References. Address D. W. C., ENGINEERING AND MINING JOURNAL. No. 16,841, Sept. 15.

A GRADUATE OF LEHIGH UNIVERSITY wants position as assistant in a chemical, metallurgical or assaying laboratory, or as instructor of chemistry, metallurgy, assaying or physics in a college or industrial school. Willing to accept small salary for a beginning. Best of references furnished. Address CHEMIST, ENGINEERING AND MINING JOURNAL. No. 16,858, Sept. 15.

MAGNETIC CONCENTRATION.—BY ME-chanical engineer with several years' experience in concentrating iron ores. Competent to take entire charge—from prospecting to erection and charge of plant. Open for engagement. South preferred. Address MAGNETIC, ENGINEERING AND MINING JOURNAL. No. 16,856, Sept. 22.

MINING ENGINEER, EXPERT METAL-lurgist and Chemist, with eleven years' experience in Spanish-speaking countries (five years as manager) in the mining and smelting of copper, lead, silver, gold and quicksilver ores, will be at liberty shortly to make a new engagement as manager or superintendent. Special experience in the management of Mexican mining properties and in the design and working of furnace plants of all kinds. Address MEXICO, ENGINEERING AND MINING JOURNAL. No. 16,951, Sept. 29.

GRADUATE OF THE MASSACHUSETTS Institute of Technology in Metallurgical Engineering desires position as forman, assistant superintendent or metallurgist; some experience. Willing to start with small salary. Address STUDENT, ENGINEERING AND MINING JOURNAL. No. 16,952, Sept. 29.

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MINING ENGINEER, NOW EMPLOYED IN Mexico, will go to Central America, preferably Honduras, with New York company as mining engineer or first assistant. Knows thoroughly language, customs and people of Spanish America. Address HONDURAS, ENGINEERING AND MINING JOURNAL. No. 16,746, e. o. w. Sept. 29.

Contracts Open.

U. S. ENGINEER OFFICE, Nashville, Tenn.—Sealed proposals for supplying stone for building lock No. 2 on Cumberland River will be received here until September 15th, 1894, and then publicly opened. All information furnished on application. JOHN BIDDLE, Capt. Corps of Engrs.

PROPOSALS FOR CONSTRUCTION OF dams and shore protections on upper Mississippi.—U. S. Engineer Office, Rock Island, Ill. Sealed proposals will be received here until Sept. 22d, 1894, and then publicly opened, for: 1. Construction of dams and shore protections between Genoa and Prairie du Chien, Wis.; 2. Construction of dams and shore protections between Glenhaven, Wis., and Dubuque, Ia.; 3. Construction of dams and shore protections between Dubuque and Clinton, Ia.; 4. Construction of dams and shore protections between Keokuk, Ia., and Quincy, Ill.; 5. Construction of dams and shore protections between Clarksville, Mo., and Hamburg, Ill.; 6. Construction of dams and shore protections between Hamburg, Ill., and Cap au Gris, Mo.; 7. Construction of dams and shore protections between Cap au Gris, Mo., and south of the Illinois River. All information furnished on application.

WATER-WORKS.—Sealed bids will be received at the office of G. H. Niemeyer, Mayor, and H. C. Eckart, Recorder, of the Town of Guttenberg, Ia., until Sept. 18th, 1894, for furnishing all material and labor required in constructing a complete system of water-works in the Town of Guttenberg, Ia. Plans and specifications will be on file in office of G. H. Niemeyer, Mayor. A certified check made payable to Treasurer of said town must accompany each bid. The Council reserves the right to reject any or all bids. HENRY C. ECKART, Recorder.

WATER-WORKS.—Sealed bids will be received at the office of the City Clerk of DeKalb, Ill., until September 4th, 1894, for the improvement of the water-works system of said city. The following items will be required: Two high grade boilers; pumping plant for domestic service, including engine, deep well power pump and power service pump; one duplex pump for fire service of one million gallons daily capacity; one half million gallon reservoir; 90 tons of 10 and 12-in. cast iron pipe with special castings; pipelaying, including removal of old pipe. Bids on boilers and machinery will be accepted from manufacturers only. Plans and specifications can be seen, and specifications for boilers, machinery and cast iron pipe, and also general form of contract and proposal, can be obtained at the office of the undersigned. DANIEL W. MEAD, Consulting Engineer, Rockford, Ill.; E. A. PORTER, City Clerk, DeKalb, Ill.

INTAKE PIER.—Sealed proposals for building and placing intake pier in the Niagara River will be received by the Secretary of the Board of Water Commissioners of the Village of Tonawanda, Erie County, N. Y., at their office, room 11 Post-office Building, until September 7th, 1894. Plans and specifications may be seen by applying at the said office, or to J. B. SNOW, Village Engineer.

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WATER-WORKS.—Sealed bids will be received at the office of G. H. Niemeyer, Mayor, and H. C. Eckart, Recorder, of the Town of Guttenberg, Iowa, until September 18th, 1894, for furnishing all material and labor required in constructing a complete system of water-works in the Town of Guttenberg, Iowa. Plans and specifications will be on file in office of G. H. Niemeyer, Mayor. A certified check made payable to Treasurer of said town must accompany each bid. The Council reserves the right to reject any or all bids. HENRY C. ECKART, Recorder.

WATER-WORKS.—Sealed proposals will be received by the Board of Water Commissioners of the Village of Hamilton, until September 6th, 1894, for the construction of water-works. The works will consist in general of about seven miles of cast iron mains, with valves, hydrants, valve boxes and special castings, a file intake, pumping station, pumps, boilers, gravity filters, water tower and other appurtenances. Bids will be received for certain separate portions of the work. Plans can be seen after August 31st, 1894, at the office of the Board of Water Commissioners at Hamilton, or at the office of the engineers, and specifications obtained from James M. Taylor, Secretary of the Board. Bids must be sealed and addressed to James M. Taylor, Secretary of the Board of Water Commissioners, Hamilton, N. Y., and marked on outside of envelope inclosing them, "Proposals for Water-Works." WM. M. WEST, President; JAMES M. TAYLOR, Secretary; MELVIN TRIPP, Treasurer. THE STANWIX ENGINEERING COMPANY, Rome, N. Y., Engineers.

IRON.—Office of the Lighthouse Engineer, Fifth District, Baltimore, Md.—Proposals will be received at this office until the 26th day of September, 1894, for furnishing the materials and labor of all kinds necessary for the completion and delivery of the metal work of the Solomon Lump Light Station, Maryland. Plans, specifications, forms of proposal and other information may be obtained on application to this office. ERIC BERGLAND, Captain of Engineers, U. S. A., Lighthouse Engineer.

DREDGING.—U. S. Engineer Office, Burlington, Vt.—Sealed proposals in triplicate, for dredging in Great Chazy River, N. Y., will be received here until October 5th, 1894. Full information furnished on application to SMITH S. LEACH, Captain Engineers.

ROCK EXCAVATION.—U. S. Engineer Office, Burlington, Vt.—Sealed proposals in triplicate, for rock excavation in Otter Creek, Vt., will be received here until October 5th, 1894. Full information furnished on application to SMITH S. LEACH, Capt. Engrs.

DREDGING.—U. S. Engineer Office, 601 Eighteenth Street N. W., Washington, D. C.—Sealed proposals for dredging at Nolini and Lower Machodoc Creeks, Va., will be received here until October 4th, 1894. All information furnished on application. CHAS. E. L. B. DAVIS, Major Engrs.

IRON-WORK.—U. S. Engineer Office, Charleston-Kanawha, W. Va.—Sealed proposals for iron-work for movable dams on the Great Kanawha River, embracing about 635,000 pounds of wrought iron and 337,000 pounds of cast iron, will be received at this office until September 27th, 1894. Specifications, blank forms and all available information furnished on application to ADDISON M. SCOTT, Resident Engineer, at the above office. WM. P. CRAIGHILL, Colonel Corps of Engineers.

WROUGHT AND CAST IRON.—West Virginia.—Sealed proposals for iron-work for the movable dams on the Great Kanawha river, embracing about 635,000 lbs. of wrought iron and 337,000 lbs. of cast iron, will be received until Sept. 27, 1894. Specifications, blank forms and all available information furnished on application to ADDISON M. SCOTT, Resident Engineer, Charleston-Kanawha, W. Va.

ARTESIAN WELL.—Illinois.—Sealed proposals will be received by the City Clerk of the City of Wenona, Ill., for an artesian well, according to the specifications therefor now on file until Monday, October 1st, 1894. The right is reserved to reject any and all proposals. Copies of specifications will be furnished on application to C. E. ERWIN, City Clerk, City of Wenona, or to GEO. C. MORGAN, 49 Major block, Chicago. C. E. ERWIN, City Clerk.

WATER-WORKS.—Sealed proposals to build water-works in the city of Greenville, Miss., will be received by the Clerk until October 2d, 1894. Upon the franchise system. Specifications on file with the City Clerk.

Continued on page 19.

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The regular monthly dividend, **TWENTY (20) CENTS PER SHARE**, has been declared for August, payable at the office of the company, San Francisco, or at the transfer agency in New York on the 25th inst. Transfer books close on the 20th inst.

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Notice is hereby given that at a meeting of the Board of Directors held the twenty-second day of August, 1894, an assessment (No. 7) of two cents (2c.) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, Room 56, Nevada Block, San Francisco, California, or to the Treasurer, J. J. Halpin, No. 57 Broadway (Room 8), New York City, State of New York, on or before the eighteenth day of September, 1894.

Any stock upon which this assessment shall remain unpaid in San Francisco on the twenty-fifth day of September, 1894, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the eleventh day of October, 1894, to pay the delinquent assessment together with costs of advertising and expenses of sale.

By order of the Board of Directors,
J. STADTFELD, JR., Secretary.
P. S.—All certificates of stock must be sent to the Treasurer to be stamped Assessment Paid.

Contracts Open.

Continued from page 18.

TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C., September 5th, 1894.—Sealed proposals will be received at this office until 2 o'clock P. M. on the 26th day of September, 1894, and opened immediately thereafter, for all the labor and materials and fixing in place complete the low pressure, return circulation, steam heating and ventilating apparatus required for the United States Post Office Building at Lewiston, Me., in accordance with the drawings and specification, copies of which may be had at this office or the office of the Superintendent, at Lewiston, Me. Each bid must be accompanied by a certified check for a sum not less than two per cent. of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid, if it be deemed in the interest of the Government to do so. All proposals received after the time stated will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked "Proposal for Heating and Ventilating Apparatus, etc., for the United States Post Office building at Lewiston, Me.," and addressed to **JEREMIAH O'ROURKE,** Supervising Architect.

U. S. ENGINEER OFFICE, BOSTON, MASS.—Sealed proposals for the delivery of Rubble-stone in the south jetty at Newburyport Harbor, Mass., will be received here until Oct. 4, 1894. All information furnished on application. **S. M. MANSFIELD,** Lieut. Colonel Engineers.

U. S. ENGINEER OFFICE, BOSTON, MASS.—Sealed proposals for delivery of rubble stone in break-water at Gloucester Harbor, Mass., will be received here until October 4th, 1894. All information furnished on application. **S. M. MANSFIELD,** Lieut. Colonel Engineers.

U. S. ENGINEER OFFICE, BURLINGTON, VT.—Sealed proposals in triplicate for repairs to Burlington Breakwater, Vt., will be received here until October 5th, 1894. Full information furnished on application to **SMITH S. LEACH,** Captain Engineers.

U. S. ENGINEER OFFICE, BURLINGTON, VT.

Sealed proposals in triplicate for dredging in Ogdensburg Harbor, N. Y., will be received here until October 5th, 1894. Full information furnished on application to **SMITH S. LEACH,** Captain Engineers.

U. S. ENGINEER OFFICE, BOSTON, MASS.

Sealed proposals for dredging in Powow River, Massachusetts, will be received here until October 4th, 1894. All information furnished on application. **S. M. MANSFIELD,** Lieut. Colonel Engineers.

WATER-WORKS.—The City of Decatur, Ind., desires to put in a system of water-works and has adopted plans and specifications therefor. Owing to the city being already indebted to the constitutional limit, the Council has adopted the following plans and asks propositions thereon: The city will give a franchise to any person to put in a plant, but reserve the right to rent the plant of the owner. The annual rental paid by the city to be \$4,000. This annual rental is to be applied as follows: 1. To the payment of 6% interest on the total cost of plant. 2. The balance of payment to be applied each year upon the principal sum. When the payments upon the principal sum equal the principal sum then the plant is to be the property of the city. This insures investors 6% interest on their money and annual repayment of a portion of principal. Detailed information will be supplied by me. All bids must be based upon plans adopted by the Council, must be with and without stand-pipe, and must be on file with the undersigned before September 18th, 1894. **ALBERT BRITTON,** Clerk, City of Decatur, Ind.

WATER-WORKS.—Sealed proposals to build Water-Works in the City of Greenville, Miss., will be received by the Clerk up to Oct. 2, 1894. Upon the franchise system. Specifications on file with the City Clerk.

WATER-WORKS.—SEALED BIDS WILL BE received at the office of G. H. Niemeyer, Mayor, and H. C. Eckart, Recorder of the town of Guttenberg, Iowa, until September 18th, 1894, for furnishing all material and labor required in constructing a complete system of water works in the Town of Guttenberg, Ia. Plans and specifications will be on file in office of G. H. Niemeyer, Mayor. A certified check made payable to Treasurer of said town must accompany each bid **HENRY C. ECKART,** Recorder.

HORIZONTAL PUMPING.—Office of the Department of Public Works, Chicago.—Sealed proposals will be received by the city of Chicago until October 11th, 1894, for two horizontal compound condensing pumping engines, each engine having a capacity of 14,000,000 U. S. gallons of water in twenty-four hours, with the necessary boilers and all appurtenances ready for daily use, one engine to be erected at the Sixty-eighth street pumping station and one engine to be erected at the Lake View pumping station, in the city of Chicago. According to plans and specifications on file in the office of the Department of Public Works in said city. Proposals must be made out upon blanks furnished at said office, and be addressed to said department, indorsed "Proposals for Horizontal Pumping Engines." **H. J. JONES,** Commissioner of Public Works.

PIPE, CASTINGS, ETC.—Sealed proposals will be received by the Building Committee of Beaver Falls, Pa., Council, until October 2d, as follows: For 2,800 tons cast iron water pipe and special castings; 200 fire hydrants; 265 valves and valve boxes; the laying of 20 miles of 4 to 16-in. pipe. For the sinking of a sufficient number of tubular wells to obtain a 6,000,000 gallon supply of water. **PUMPS.**—Also, until October 16th, for two 3,000,000 gallon pumps, and for the building of a 6,000,000 gallon reservoir. **FILTERING PLANT.**—Also, until November 6th, a complete filtering plant, with a capacity of 3,000,000 gallons in 24 hours, and buildings to contain the pumps, boilers and filtering plant. Plans may be seen and detail specifications for the above-mentioned work and material can be obtained of the Borough Clerk, W. W. Kerr, and also at the office of the engineers, James H. Harlow & Co., Times Building, Pittsburgh, Pa., and Wilkesburg, Pa., two weeks previous to the above dates. **SAMUEL CREESE,** Chairman; **H. F. DILLON,** L. S. LUTTON, A. O. MEYERS, TITUS WELSH, Building Committee. **JAMES H. HARLOW & CO.,** Engineers.

BRIDGE.—Sealed proposals will be received by the Board of Chosen Freeholders of Middlesex County, N. J., at their office in the County Court House, New Brunswick, N. J., until October 3d, 1894, for rebuilding the Landing Bridge over the Raritan River, in accordance with plans and specifications prepared by Geo. H. Blakeley, Consulting Engineer. Plans and specifications can be seen at the office of Asber Atkinson, County Engineer, George Street, New Brunswick, N. J. The Board of Chosen Freeholders of Middlesex County, **MICHAEL WELSH,** Director.

PUMPING ENGINES.—Department of Public Works, Chicago.—Sealed proposals will be received by the city of Chicago until October 11th, 1894, for two vertical compound pumping engines, each engine having a capacity of 15,000,000 U. S. gallons of water in 24 hours, with the necessary boilers and all appurtenances ready for daily use, to be erected at the Chicago avenue pumping station, in the City of Chicago. According to plans and specifications on file in the office of the Department of Public Works of said city. Proposals must be made out upon blanks furnished at said office and be addressed to said department, indorsed "Proposals for Vertical Compound Pumping Engines." **H. J. JONES,** Commissioner of Public Works.

DAM.—Sealed proposals for constructing a dam, a retaining wall and a pump pit together, with foundation piers for vertical pump, will be received at the office of the undersigned until October 3d, 1894. Plans and specifications can be seen at the office of the undersigned. Specifications and forms of proposal will be furnished upon application. Proposals must be enclosed in envelopes, sealed and marked "Proposal for New Water Supply," and addressed to the Board of Water Commissioners, care of R. W. Havens, City Engineer, Dallas, Tex. **R. W. HAVENS,** City Engineer.

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