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\* Illustrated.

Table with 4 columns: MINING NEWS, FOREIGN NEWS, METALS, and PHILADELPHIA. Lists various news items and prices for metals and minerals.

Recently negotiations were undertaken for the formation of a new zinc syndicate of the European companies, the object, of course, being to limit production and maintain prices of the metal. They were not successful, chiefly because the Silesian producers put their figures at so high a point that the Belgian and French companies would not concede the proportion which these competitors asked.

An interesting experiment has been undertaken by Mr. Huntley, the manager of the Morning Mining Company's property, at Mullan, in the Cœur d'Alene district in Idaho. He has leased the mine from the company and proposes to run it on a co-operative basis, his plan being fully set forth in our news columns.

The production of pig iron in the United States continues to show new growth. The monthly reports from the furnaces show an increase in the weekly capacity of those in blast on October 1st of 9,300 tons, or 5.2 per cent., over that reported at the beginning of September.

The increased production is somewhat unequally distributed. The charcoal furnaces show practically no change, and the capacity of the anthracite furnaces in blast actually decreased about 10 per cent. The entire gain—besides the loss in the anthracite iron make—was in the coke furnaces, which show an increase of 8 in the number active and of nearly 12,000 tons, or 10 per cent. in weekly output.

The charcoal furnaces, as we have noted, show no change. Most of their work to supply a special demand, and are not much affected by general prices. The anthracite furnaces, as a rule, are not so well situated as their coke-using rivals with regard to fuel and ore supplies, and so have to leave the market to the latter.

The latest mining "boom" started on the London market is in the West Australian goldfields. Public attention was drawn to the colony by the reports of the extraordinary richness of the Bayley's Reward claim, the first discovery made in the Coolgardie district, and the promoters, who are always on the watch for an opportunity, have taken the fullest advantage of this one.

It seems hardly necessary to say that many of these investors are doomed

to disappointment. It is quite possible that other rich pockets like that found at Bayley's Reward exist in the Coolgardie district, but there is no assurance yet of permanence in the field. The conditions are most unfavorable for mining. The gold region is remote and difficult of access, the cost of conveying machinery and supplies there is enormous, fuel and water are extremely scarce, and the surrounding section is too dry and barren to permit the building up of agricultural settlements from which supplies could be drawn in the future. Even with a railroad line to the district completed, as is now proposed, mining on a large scale will be expensive work. Nevertheless the "boom" is on, and much money will evidently be put in by investors who will not investigate for themselves or take warning from the past.

#### ALUMINUM ALLOYS FOR CONSTRUCTIONAL PURPOSES.

An important event, which may without exaggeration be termed a landmark in metallurgical progress, took place on September 29th, when an aluminum-bronze torpedo-boat, made by Yarrow & Co., of London, for the French Government, achieved a remarkable success on her trial trip at the mouth of the Thames. This is really the first instance of aluminum being used on a large scale for constructive purposes where great tensile strength and rigidity are indispensable. Up to the present time the examples of the application of the metal on a large scale have been few. We have heard of boats and launches built of this metal, but such craft would not be submitted to greater strains than wooden ones. Then again, in the manufacture of scientific instruments, domestic utensils, etc., from aluminum or its alloys lightness is the only consideration. We may therefore take it that the performances of this new torpedo-boat will give metallurgists the first opportunity yet vouchsafed to them of judging of the value of aluminum alloys as constructional metals.

The torpedo-boat in question is of the second-class type. It is 60 ft. long by 9 ft. 3 in. beam. The propelling machinery consists of a triple-expansion high-speed engine fed with steam from a Yarrow water-tube boiler. In the two hours' trial the average revolutions per minute were 591, the boiler pressure 181 lbs., and the mean speed attained 20.5 knots. The total weight of the hull and machinery with the water in the boiler is 21,000 lbs., and the weight of the hull alone is two tons. The hull of a similar boat made of steel weighs on an average four tons, and in none of the same class has it been possible to obtain a greater speed than 17 knots heretofore. As compared with the steel boats the scantling has been thickened about 25 per cent. all through. The alloy consists of 94 parts of aluminum and 6 parts of copper. Its tensile strength is 14 tons to the square inch, and its elastic limit is very high. The price of the various constructional parts varied from 72 cents to \$1.20 per pound.

The above figures are somewhat general in character, and several items of interest are omitted. For obvious reasons the builders and the owners of the vessel do not care to publish too detailed an account of their new departure. Generally speaking, however, it is clear that the increase in the framing greatly increases the rigidity of the structure, and this, together with the superior physical characteristics of the alloy, has enabled the builders to submit the boat to an extra driving strain corresponding to  $3\frac{1}{2}$  knots more than a similar boat built of steel. It may be mentioned here that Mr. Yarrow has devoted more attention to the balancing of marine engines and the reduction of vibration than has any one else, and both his steel boats and this aluminum-bronze boat are almost entirely free from that unpleasant vibration which so often neutralizes the efficiency of fast vessels.

While the fact that the employment of this alloy allows the great increase in the scantling is the most important feature to be noticed, the reduction in the weight of the boat is of considerable utility in other ways. These boats are intended to be carried on battle-ships and cruisers, and any decrease in the weight reduces the load on the larger warship, besides facilitating the handling and launching. The aluminum-bronze boat also has the advantage of greater buoyancy.

Whatever may be the technical and scientific advantage of this alloy for constructional purposes, the commercial aspect of its application is at present rather hopeless. From 70 cents to \$1.20 for various shapes is a prohibitive price for general purposes, and it is only in very urgent or special cases where its use would be justified.

#### THE RIGHT OF RAILROAD EMPLOYEES TO STRIKE.

The United States Circuit Court of Appeals delivered October 1st a long opinion, prepared and read by Justice Harlan, reversing in one particular, and sustaining in other respects, the famous decision of Judge Jenkins, maintaining his injunction to restrain the employees of the Northern Pacific Railroad from executing a proposed strike. The decision says:

"The vital question is, whether a court of equity will, under any circumstances, by injunction prevent one individual from quitting the personal service of another."

This question is decided in the negative, and therefore it is declared that the court below should have eliminated from the writ the words:

"And from so quitting the service of the said receivers, with or without notice, as to cripple the property or prevent or hinder the operation of said railroad."

Justice Harlan puts this decision on the ground that the prohibition quoted is "an invasion of one's natural liberty." I do not understand, therefore, that it applies to cases in which natural liberty has been already exercised in the execution of a contract. Courts of equity may certainly compel the performance of contracts, or forbid their violation, when the circumstances are such that the legal remedy of damages would not be practicable or adequate. It is, I take it, only when the employee is otherwise free to leave work that he cannot properly be restrained by injunction on the mere ground of the injury that may thereby be caused to his employer, or the inconvenience that may result to the public. If I am right in this view, the remedy of employers should be to make such contracts with employees as will secure one party against sudden dismissal and the other against abandonment of work without notice. This has been done in many cases, and it ought to be feasible with regard to all employees who are essential to the ordinary operation of a business. No doubt there are many cases of temporary and fitful employment in which such an arrangement would be difficult.

On the other hand, the main purpose and spirit of Judge Jenkins's order is really sustained by the Court of Appeals. Its declaration in this respect is unmistakable:

"It is one thing, however, for a single individual or several individuals, each acting on his responsibility, to quit work, and quite a different thing in the eye of the law for many persons to combine or conspire together with the intent, not simply of asserting their rights by peaceable methods, but of employing their united efforts to injure others or the public. It seems entirely clear that any combination or conspiracy on the part of these employees would be illegal which had for its object the crippling of property in the hands of receivers, either by disabling property, by obstructing the control or management of the property, or by using force, intimidation or wrongful methods against employees remaining in the service to induce them to quit the service. Combinations of this character disturb the peace of society and are mischievous in the extreme."

"The Circuit Court therefore properly framed its injunction so as to restrain all acts specifically mentioned. We are of the opinion that the civil court properly refused to strike from the writs of injunction the words 'and from combining or conspiring to quit the service of receivers, with the object of crippling the property in their custody.'"

It follows from this declaration that all conspiracies for mischief and all acts of violence may be properly forbidden in such cases by injunction, and therefore that the persons guilty of such offenses may be summarily dealt with for contempt of court, as well as punished in the slower way, by indictment, trial and sentence, for the violation of order.

It is one of the defenses of Debs and his associates, in the proceedings now pending against them, that the injunctions which they are alleged to have disobeyed were illegal and therefore void, because the rules of equity do not permit the use of a restraining writ to forbid beforehand an act which, once committed, would be punishable under the criminal law. The theory of this defense seems to be that the party accused of a crime is entitled to trial by jury, and that to prohibit a man or a number of men from committing, say, assault and battery, or larceny or malicious injury to person or property, and then to punish by summary proceedings, without jury trial, those who may disobey that injunction, is to cheat them out of their rights. The argument is plausible, but specious. Restraining writs are issued to prevent, not crimes, but irremediable injuries. The act forbidden may be quite lawful in itself, but that question is not necessarily considered; and it seems an absurd proposition that an act may be properly thus enjoined if it be lawful, but not if it be unlawful. Moreover, a person guilty of contempt of court in the case above supposed would be punished by the court, not for the definite crime he had committed, but for the separate offense of disobedience to its mandate. And if this disobedience had been intelligent and deliberate, the punishment would be neither less, if the act were not otherwise a penal offense, nor greater in the contrary case.

This view seems to be consistent with the decision just rendered by the Court of Appeals, and I fancy that the partial reversal of Judge Jenkins's decision by that court will bring little comfort to the organizers of violent strikes.

R. W. RAYMOND.

#### NEW PUBLICATIONS.

IOWA GEOLOGICAL SURVEY: VOL. II.; COAL DEPOSITS OF IOWA. By Charles Rollin Keyes. Des Moines, Ia.; published for the Survey. Pages 536; illustrated.

The first volume of the Iowa Geological Survey reports, which was issued late last year, contained a general consideration of the field before the survey, in which was a preliminary chapter on the coal measures of the State, a summary of which we presented to our readers in the "Engineering and Mining Journal." The material, the collection of which had then begun, has been largely added to, and the preliminary sketch has been developed into the present volume, which is the first in the series to be issued; appropriately so, since the coal measures constitute by far the most important source of mineral wealth in the State, and have already furnished a valuable addition to its industries. Up to the present time no systematic investigation of the Iowa coal deposits had ever been made. It is true that as early as 1847, and again in 1856, some work in this direction was done, but these surveys by B. D. Owen and A. H. Worthen, respectively, amounted merely to reconnaissances along the Des Moines river, and no opportunity was given to either for careful ex-

amination. In 1886, again, some steps were taken for the study of the mineral resources of the State, but the work was suspended before it had been fairly begun, and the notes made were of too incomplete a character to be valuable. The institution of the present State Geological Survey was therefore the first real attempt at the proper study and description of the mineral resources of Iowa. Generally regarded as a purely agricultural State, Iowa has, nevertheless, reached the point where its coal output forms an important item in its wealth, and stands fifth in the list of coal producers of the United States; while in its clays of various descriptions, it has another valuable resource, which so far has been but little developed.

The present volume, after a preliminary chapter on the origin and general conditions of coal deposits, treats first of the carboniferous basin of the Mississippi Valley, of which the Iowa deposits form a large part, and then of the general geology and geographical limits of the coal measures, of their lithology and stratigraphy; the last named chapter including a description of the different coalbeds which have so far been developed. Following these is a chapter on the character and extent of the seams and their locations. To this again succeeds a description of the mines now operated in the various coal-producing sections of the State. A separate chapter treats of the composition and properties of Iowa coals, giving numerous analyses. A chapter is devoted to waste in coal mining, with suggestions for improvements in the methods adopted, while the concluding chapter is chiefly statistical, showing the growth of the industry, its present condition and prospects for the future. The whole book forms a valuable and interesting monograph which ought to be read with interest, not only by those immediately concerned, as the coal operators of the State, but by geologists everywhere. The importance of such a study is shown by the fact that a very large amount of money has been expended in the search for coal in places where, in the light of the present study, it is clearly apparent that success was utterly hopeless. Throughout the State deserted shafts and abandoned diggings tell of useless expenditure and waste of capital which might have been avoided had such authoritative information, as is contained in the present volume, been accessible.

The work which has resulted in this volume seems to have been well and thoroughly done, although the author does not claim that it is more than a preliminary report, since the complete study of the subject will require further time and investigation. The study of the surface geology and of the outcroppings, with the facts ascertained in the coal workings and shafts already sunk, has been to some extent supplemented by borings in various localities, which need, however, to be very much extended before a complete knowledge of the subject can be claimed. Facts enough have been gathered, however, as we stated before, to make the present monograph a valuable one. We may add that its value is increased by the numerous and excellent illustrations, and by the full and carefully prepared index which is appended.

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.

*La Metallurgie en France.* Par Urbain le Verrier. Paris. J. B. Bailliere et Fils. Pages 333; illustrated. Price 3 fr. 50.

*A Manual of the Study of Documents.* By Persifer Frazer. Philadelphia, Pa.; J. B. Lippincott Company. Pages 218; illustrated.

*The Coal Supply of Japan.* By T. Wade, late director of Imperial Mining Office and Geological Survey. Tokio, Japan. Pamphlet. Pages 7.

*United States Geological Survey: Bulletins Nos. 97, 98, 100, 102, 104, 105, 106, 108, 110, 111 and 113.* Washington; Government Printing Office.

*Losses in Gold Amalgamation: with Notes on the Concentration of Gold and Silver Ores.* By Walter McDermott and P. W. Duffield. Chicago, Ill.; Fraser & Chalmers. Pages, 47. With six plates.

*Central Station Bookkeeping and Suggested Forms; with an Appendix for Street Railways.* By Horatio A. Foster. New York; The W. J. Johnston Company, Ltd. Pages 139; with diagrams. Price \$2.50.

*Practical Hints on the Construction and Working of Regenerator Furnaces.* By Maurice Graham. London, Eng.; E. & F. N. Spon: New York; Spon & Chamberlain. Pages 131. Illustrated. Price, \$1.25.

*Deutsch-Spanisch-Franzosisch-Englischer Worterbuch der Berg- und Huttenkunde sowie deren Hilfswissenschaften.* By Max Venator, Bergwerksdirector in Rositz bei Altenburg. Leipzig, Germany; A. Tzietmeyer. Pages, 108.

*Theory and Construction of a Rational Heat Motor.* By Rudolf Diesel. Translated from the German by Bryan Donkin. London, Eng.; E. & F. N. Spon: New York; Spon & Chamberlain. Pages 85. With diagrams. Price, \$2.50.

*Photographs of the Coal Mines in Cannock Chase, Walsall Wood and other South Staffordshire Collieries, England.* Twenty-four stereoscopic views of interiors and exteriors. Caswell & Bowden, Ltd., Birmingham. Price 1s. 9d. each.

*California State Mining Bureau: Bulletin No. 3; The Gas and Petroleum Yielding Formations of the Central Valley of California.* By W. L. Watts, M. E., Assistant in the Field. Sacramento, Cal.; State Printing Office. Pages 100; illustrated, with maps.

*Ueber Vorkommen und Gewinnung der Nutzbaeren Mineralien in der Sudafrikanischen Republik (Transvaal) unter besonderer Berucksichtigung des Goldbergbaues.* Von Berggrath Schmeisser. Berlin, Germany; Dietrich Reimer. Pages 151. With maps.

*Annual Report of the Minister of Mines for the Year Ending December 31st, 1893: Being an Account of Mining Operations for Gold, Coal, Etc., in the Province of British Columbia.* Victoria, B. C.; printed by Richard Wolfenden, Printer to the Queen. With maps.

*United States Geological Survey: Thirteenth Annual Report to the Secretary of the Interior, 1891-92. In three parts. Part I., Report of Director; Part II., Geology; Part III., Irrigation.* By J. W. Powell, Director. Washington; Government Printing Office.

CORRESPONDENCE

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

Wanted—A Definition.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Can you or any of your readers explain and define a "contact fissure vein"? The term was brought up at a recent trial of a mining case in Gunnison County in this State, and was new to many of those concerned, and some at least considered it a combination of words of such opposite meanings as to be something which could not or does not exist. The vein in controversy is a stratum of light gray limestone, said to be magnesian, between a black slate hanging wall and a siliceous limestone foot-wall, which, it is claimed, have been traced along the mountain-side for 8,000 ft., in an easterly and westerly direction, and which dip to the north, in common with the other rocks of the mountain, at an angle of 35°.

COLORADO SPRINGS, Colo., Oct. 2, 1891.

E. R. WARREN.

Sulphate of Lead as a Pigment.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Noticing a communication in your paper of January 27th from your London correspondent in regard to the "Health of Lead Smelters and White Lead Workers in England," in which reference is made to a report, from the committee therein mentioned, that the sulphate of lead indorsed as a substitute is much cheaper to make and far less poisonous, yet is, in the opinion of the committee, far from equaling the carbonate as a pigment and in covering power, I beg to say that it doubtless is true that sulphate of lead made by certain processes is not a good pigment, just as it is true that carbonate of lead made by certain processes is not a good pigment. Pure carbonate of lead does not exist as a commercial pigment; it would probably be of very inferior quality for that purpose. What commercially is called carbonate of lead is a compound of carbonate of lead and hydrated oxide of lead, and this is a good pigment provided it is made by corrosion of metallic lead; if made, for instance, from a solution of sub-acetate of lead it is not a good pigment. So with sulphate of lead made in certain processes: it may be inferior as a pigment, while that peculiar compound of sulphate and oxide of lead made by the Picher Lead Company is an amorphous powder, and, we claim, has been proved by experience to be superior in covering capacity and in all essential qualities of a pigment to the carbonate of lead made by the Dutch process of corrosion.

No information is given as to how thoroughly the investigation of the committee on this line has been made. The most important test of a pigment is time and long experience; this has established the merits of sublimed white lead as a pigment satisfactory in all respects.

JOPLIN, Mo., Oct. 1, 1894.

C. V. PETRAEUS.

Does Native Crystallized Copper Contain Silver?

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Two questions, in explanation of which there is little or no printed information, have been occasionally asked by scientists concerning the native copper of Lake Superior; and the work here presented was deemed necessary to answer the above query, and also the companion question, "Does the native mass copper contain iron in chemical combination?"

A variety of specimens were selected from the amygdaloid and conglomerate formations, and the results of analysis are stated in the following table. In the amorphous mass-copper, the iron and silica were determined, but not the silver, as that is well known to be present in all masses in varying amounts. Good native crystals cannot be obtained from the conglomerate. Apparently solid native metal when cut open is generally found to contain tiny fissures, penetrating a considerable distance, and filled with a brownish red sand, so that much metal must be chipped off before solid pieces can be obtained.

AVERAGE RESULTS.

Mineral formation.	Physical condition.	Iron %.	Silica %.	Silver.	
				%.	Oz. per ton.
Tamarack and C. & H. conglomerates.	Irregular, rounded masses	0.0032	0.0040	variable	
Quincy amygdaloid.	Irregular angular	0.0025	6.0026	"	"
Iste Royale	Crystals, large cubical	0.0055	0.0094	2.74	
Quincy amygdaloid.	Crystals, small branching.	not estimated	0.0100	2.92	

All the silica was obtained from a trace of brown powder remaining undissolved by acid, and the brown color was due to iron in amount one-fourth of the total iron reported. It is evident that pieces of native copper of any size cannot be obtained perfectly pure; but it is considered very probable that the whole of the iron may have existed, originally, as oxide with the silica and occluded in fine particles by the copper.

It is a rather curious coincidence that the native crystals show about the same percentages of silver and iron that have been found in the refined electrolytic coppers of trade. It appears that the best technical processes have not been able to produce purer metal than the best examples of nature's work.

GEORGE L. HEATH.

C. & H. SMELTING WORKS, S. LAKE LINDEN, Mich., Oct. 4, 1894.

The Mineral Industry, Vol. II., 1893.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: We cannot see how concerns in the mineral line can do well without the MINERAL INDUSTRY.

M. M. KANN,

Sec'y and Treas., Pittsburg Crushed Steel Company, Ltd. PITTSBURG, Pa., July 11, 1894.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: We would say that we keep it (THE MINERAL INDUSTRY) at our

desk, and consider it as a very valuable book, containing a great amount of very important information.

EIMER & AMEND,  
Manufacturers and Importers of Chemicals and Chemical Apparatus.  
NEW YORK, Aug. 1, 1891.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: We can only echo the universal opinion of the MINERAL INDUSTRY'S great value for reference, together with our unlimited admiration for the industry displayed in compiling such a vast quantity of statistics. We consider it of great and permanent value.

NEW YORK, Aug. 1, 1891.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: In acknowledging receipt of the MINERAL INDUSTRY, Vol. II, I feel that no ordinary praise can do justice to the gigantic task which you have fulfilled with such conspicuous success. The book is a perfect encyclopedia of information on the subjects of which it treats, and will be an indispensable companion to every mining man.

HENRY F. COLLINS,  
Mining and Metallurgical Engineer.  
GUADALCAZAR, San Luis Potosi, Mex., July 28, 1891.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I beg to acknowledge the receipt of your splendid volume on the MINERAL INDUSTRY for 1893. The success of the well conceived undertaking obtained with the preceding volume, raised by us great expectation, which was surpassed by the improved arrangement and development of the enormous and substantial material you collected on the various subjects connected with the mineral industry in all countries of the world. I am very glad to express my best compliments for the new and very important success obtained by you.

N. PELLATI  
General Inspector of Mines.  
ROME, Italy, July 20, 1894.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Great was my surprise on receiving Vol. II. of the MINERAL INDUSTRY to find it larger and more replete with indispensable information than the first volume. It was thought by many that the acme of usefulness and completeness had been reached in Vol. I., and that there would be little to add in succeeding volumes; but it is now evident that, if the editor and publishers of this annual encyclopedia of mines and mining intend to furnish each year a record of the progress made in mining and metallurgy, there is sufficient material to constitute the most valuable summary of the mining industry ever published in any language.

HORACE V. WINCHELL,  
Geologist and Mining Expert.  
MINNEAPOLIS, Minn., July 30, 1894.

A New Classification of Useful Mineral.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: In my work and lectures upon economic geology I have found a great need of some simple term that could be used to designate all the useful or valuable deposits known to man that come under the domain of economic geology—one that would include not only the metalliferous

CLASSIFICATION OF UTILITES OR USEFUL GEOLOGICAL PRODUCTS, BASED ON THEIR USES.

Utilites.	Aerites (Aes), or Metallites... (μεταλλων)	Ores, or Metalliferous Materials.	Non-aerites, or Non-metalliferous Materials.	Tectonites (τεκτων)...	Construction Materials, or Building and Road Materials.
				Cosmites (κοσμος) ...	Decorative Materials, or Ornamental Stones and Gems.
	Pyrolites (πυρολιθος)...	Refractory, or Fire-resisting Materials.			
	Chalices (χαλις).....	Binding Materials, or Limes, Mortars, Cements, etc.			
	Ceramites (κεραμις)...	Fictile, or Ceramic Materials.			
	Rholites (ροη+λιθος)....	Smelting Materials, or Fluxes.			
	Vitrites (vitrum).....	Vitrifying Materials, or Glass, etc.			
	Tribolites (τριβος+λιθος)	Abrasives, or Attrition Materials.			
	Thermites (θερμις).....	Fuels or Burning Materials, or Carbonites.			
	Grapholites (γραφη+λιθος)	Graphic, or Illustrative Materials.			
	Lubricites (lubricum)....	Lubricants, or Friction Materials.			
	Chromatites (χρωμα)...	Color Materials, or Paints, Pigments, etc.			
	Coprites (κοπρις).....	Fertilizers, or Mineral Manures.			
	Salites (sal) .....	Salts and Saline Materials.			
	Ignites (ignis) .....	Pyrotechnic Materials.			
Pharmacites (φαρμακων)	Mineral Medicines.				
Chemites (χημειω).....	Chemical Materials.				

deposits, but also the non-metalliferous ones, like the various building stones, coal, gypsum, salt, petroleum, gas, etc. In a conversation had in August, 1893, with my friend, Prof. R. A. F. Penrose, Jr., upon the sub-

ject of classification of ore deposits, he spoke strongly of having a similar need, and expressed a wish that as I had given considerable attention to questions of classification of ore deposits, rocks, etc., that I should try to meet this want. Emboldened by this request, I have tried to find some term that would answer the purpose. I have also felt strongly the need of some simple terms that could be used to replace the cumbersome terms "metalliferous," or "ore deposits," and "non-metalliferous deposits," as in economic geology the divisions between the two are sharply drawn. A truly scientific classification of the various mineral deposits used by man does not seem to be practicable at present, because the divisions are now purely arbitrary, and based solely upon the question of the artificial use man makes of these, since many of the so called non-metalliferous deposits are as truly metalliferous as those classed under that head, but are placed under the former class simply because man uses them to obtain some other product than metals from them. Until such an artificial distinction has been given up, a philosophical definition of the two classes is not practicable, and can only suggest such terms as will in the present state of the science seem to answer the present needs.

In the same way further artificial subdivisions can be made according to the various uses man puts the various materials to.

I accordingly send you two classifications, one of which was published in a somewhat different form early in January, 1893.

I send these in the hope of obtaining suggestions and criticisms from your numerous readers, that may in the end result in arranging some simple and practical scheme that will be scientific and at the same time useful.

M. E. WADSWORTH.  
MICHIGAN MINING SCHOOL, HOUGHTON, Mich.

IRON PRODUCTION IN GREAT BRITAIN.

The returns collected from the manufacturers, and recently published by the British Iron Trade Association, give an official statement of the production of raw iron in the United Kingdom for the first half of 1894. The return is encouraging to the English makers, in so far as it shows a gain over the first half of 1893, though that gain is relatively small. The total production of pig iron as thus reported is 3,708,270 tons, and the increase is 42,733 tons, or about 1.2%. The average number of furnaces in blast was 335, as compared with 310 last year. The production was fairly well distributed among the different districts, as the strike of the Scotch coal miners did not begin to affect the furnaces in that part of the kingdom until after the end of June. The most marked increase was in the Cleveland district, which, in fact, accounts for much more than the whole gain in the output, and which is offset by losses in the south Wales district and in Scotland.

The number of furnaces in blast for the half-year made up an average of 335, as we have stated above. The total number of furnaces reported as existing in Great Britain at the close of June was 688, but how many of these are permanently out it is difficult to ascertain. There has been a very considerable decrease in numbers in the English furnaces during the past few years, but, as is the case also in this country, this reduction is not necessarily a loss. Many of the furnaces abandoned and dropped from the list are small and of antiquated construction, and their place is much more than filled by the large and new furnaces which are at the present time the only ones able to compete for business. The average make per furnace in blast for the half-year was 11,069 tons of pig. This average varied very much in the different districts, the highest reported being 17,164 tons for the furnaces of the Cumberland district, which make chiefly Bessemer pig, while the lowest was 5,044 tons for the Shropshire furnaces, in a district which makes comparatively little iron, and that of a somewhat inferior quality. The Cleveland, Lancashire and South Wales districts show the highest averages after Cumberland, while Derbyshire and Staffordshire come next to the lowest in the list. The Scotch furnaces show a somewhat small average, 6,333 tons per furnace.

Of the iron made a little over 50%, or 1,899,306 tons, was classed as forge and foundry irons; about 42%, or 1,578,585 tons, as Bessemer pig; 5%, or 171,676 tons as basic iron, while the remaining 58,703 tons were spiegel-eisen and ferro-manganese. The production seems to have kept pace nearly with the consumption and export, since the stocks reported show little change, whether comparison be made with the close of 1893 or with the first half of that year. Since June there has been somewhat of a falling off in production, owing to the stoppage of nearly all the Scotch furnaces in consequence of the coal strike, the shortage being only partially made up by an increased output from other districts.

With regard to the different classes of iron, there is but little to note, except, perhaps, a gradual gain in the quantity of Bessemer pig, as compared with that of forge iron. In England, as in this country, though perhaps not quite to the same extent, the substitution of steel for wrought iron goes on continuously, and may, indeed, be said to point to the time when the puddling furnace will be rather a matter of history than of present practice. The output of basic iron does not increase, as the English irons do not especially favor that process.

While the production of the half-year makes a fairly favorable comparison with 1892 and 1893 it shows still a decrease from the high-water mark reached in 1888 and 1890, when the pig-iron output of Great Britain reached a maximum of 8,150,000 and 8,450,000 tons respectively. The present indications are that it will hardly reach that maximum again, and that the production of about 7,500,000 tons, which the report now under consideration would indicate, for the current year is as much as can be expected. This fact seems to be conceded by a good many of the English authorities themselves.

A notable feature is the extent to which the dependence on foreign ores is reaching. The Iron Trade Association does not give the exact figures for the half-year, but from other sources we find a large increase reported in the imports of iron ore. The greater part of the Bessemer furnaces depend upon imported ore. Spain has been a chief source of supply so far, but attention is being turned to Scandinavia, and increasing demands are made upon the mines of that northern country.

While the British furnaces have shown a better half-year than our own for the corresponding period, the probability is that during the second half of 1894 we shall overtake our competitors across the water, with a chance of showing a gain upon them next year.

THE BRIDGEPORT MEETING OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.

A number of interesting discussions were had at the meeting on papers presented. Among the more important was one upon the paper of which we give an abstract below:

COAL DUST AS AN EXPLOSIVE AGENT. BY DR. R. W. RAYMOND.

The author calls attention to a book just published by Mr. Donald M. D. Stuart a mining engineer of Bristol, Eng., which describes an explosion occurring in November, 1893, at the Camerton Collieries in Somersetshire. In these two collieries, which have been worked for over 100 years, the faulted geological structure, the subsidence of large areas of the roof and the extensive goaves resulting from the operations of a century combine to furnish the most favorable conditions for the collection of fire-damp; but this gas has never been discovered either before or since the explosion of last November, and these collieries have been and still are worked with naked lamps exclusively. This fact seems to preclude the hypothesis that the explosion was caused by fire-damp, and this conclusion is confirmed by the fact that no carbonic acid was detected in the gas produced by the explosion. Other facts pointed also in the same direction. The series of 10 successive explosions originated in a shot fired with gunpowder, and Mr. Stuart proposes the explanation that the heat developed by the explosion of the gunpowder was sufficient to distil the coal dust in the immediate neighborhood and even to dissociate the hydrocarbons thus set free, leaving free hydrogen as an explosive gas and depositing carbon dust; and that the hydrogen coming into contact with the oxygen in the air current suffered an explosive combustion which generated fresh heat sufficient to distil and dissociate a new body of gas, this reaction occurring again and again until so much heat had been lost that the process could repeat itself.

Dr. Raymond says that, so far as he knows, free hydrogen has not been conceived hitherto to be present in the explosive gases of coal mines, and the supposition that it may be produced by the simple heat of an ordinary shot, and may become the agent of an aggregate effect far exceeding the mechanical energy of the shot itself challenges close and skeptical criticism. If Mr. Stuart's theory of this case is correct, how are we to explain the fact that while gunpowder has for so many years been used in mines where coal dust was in suspension in the air, no previous shot in these collieries or in any others is known to have initiated such a coal-dust explosion? The pertinency of this latter query is emphasized by the fact that the coal dust from this very district was tested not long before at the Camerton explosion by Mr. H. Hall, whose report to the Coal Commission shows that eight experiments failed to produce explosive ignition. In these experiments coal dust was scattered into an old shaft free from fire-damp, and a cannon charged with 1½ lbs. of gunpowder was fired up the axis of the shaft into the dust-laden air. Mr. Stuart's only explanation of the different behavior of the coal dust in the Camerton Collieries at the time of the accident is that the peculiar conditions of these mines were such as would render the dust held in suspension in the air very dry and sensitive. The large volume and high illuminating power of the gas obtained from this coal indicates, Mr. Stuart says, that the coal dust was a favorable material for yielding a gaseous mixture and contained a good proportion of the higher hydrocarbons in an ascending scale of explosive combustion. Thorough watering of the coal dust in the vicinity before firing a shot is, he thinks, probably the most effective protection known at the present time, but he adds that a mere dampening of the surface would probably not be sufficient.

DISCUSSION.

Dr. Raymond: Mr. Stuart has carefully analyzed the subjects of these explosions, and we have the very uncommon case of explosions of considerable force and doing considerable damage over a wide area, occurring at coal mines that had never before been known to have an atom of fire-damp in them, have never been known since to have any fire-damp. I have sketched in this paper the most interesting theory of that explosion, according to which the mere heat of the gunpowder shot which started the explosion was so great as to distil suspended coal dust and to dissociate the carbon and hydrogen of the hydrocarbons thus distilled so as to give free hydrogen gas, and to deposit on the colliery surface of the gangways in the neighborhood fine carbon and coal dust; that this hydrogen gas then passed on down the galleries and exploded by instantaneous combustion where it met the cross currents, and that explosion distilled a smaller quantity of coal dust at that spot, and that hydrogen thus produced went and exploded again at another crossing, every time losing some heat, but at all times, by repetition of explosions to the number, I think of 11, repeating to some extent that same phenomenon of the distillation of coal dust and dissociation of hydrocarbons. In proof of that theory Mr. Stuart has gone into very elaborate heat calculations based on Dr. Abel's. He has produced the carbon that was deposited at these different spots, and has also produced much corroborative evidence to prove his point. I call the attention of members to it because it is the only case that I know of in which there has never been a suspicion, and almost positive proof to the contrary respecting the presence of fire-damp. The results of English, French and Austrian experience have all gone to show that suspended dry coal dust was very dangerous in the presence of fire-damp, but no one has heretofore shown that coal dust would explode without the presence of fire-damp. Here is a case where it is almost impossible to believe that there was any fire-damp present, and yet 11 explosions occurred there which destroyed property and burnt people. There was no product of oxidation found—no carbon monoxide.

Mr. Day: That last point is a vital one. I would like to say that we may consider this thinly-powdered dust of coal as only very slightly different from a hydrocarbon gas. Now to say that this coal dust was subjected to destructive distillation, setting free hydrogen and depositing coke, is applying to the rough conditions of a mine what we have never yet obtained by careful laboratory experiments. I would doubt offhand that there was no carbonic oxide found there. There is no reason why carbonic acid should have been there. If you take any such gas and burn it with an insufficient supply of air, whether you obtain a large volume of imperfectly pure carbon or some hydrocarbons very rich in carbon, or whatever your proportion of products may be, depends on the conditions of burning, but you are not apt to have very much carbonic acid, although you might have some carbon monoxide. But, with the conditions

present here, it is more easy to conceive of a combustion with the very products mentioned, than of any destructive distillation. A destructive distillation of hydrocarbon, which involves free hydrogen and free carbon, is more difficult to conceive of than any other solution you can bring up, because the very highest temperatures we are acquainted with are those most favorable for that kind of decomposition. I have heated ethylene for something like six weeks at a very low temperature where destructive distillation just began, to prove that at a certain temperature there was no destructive distillation, and I found that temperature was something like 350° Centigrade. Going up higher you begin to get other gaseous products, but to get pure hydrogen and pure carbon you have to go up to about as high a temperature as it is easy to produce—about up to the melting point of iron. But a complete dissociation is an ideal thing, very seldom to be found. With the conditions existing in this mine, a large amount of free hydrogen and carbon formed by destructive distillation is what you would least expect in the light of experiments, but a combustion involving the products mentioned is not to be wondered at.

A member suggested that while it is impossible that there would be an explosion clear up to the margins of the walls, which would absolutely deposit all of the carbon solid and leave none of it to be burned, we may believe that the coal might have been distilled into hydro-carbon gases; but then we must also believe that this hydrocarbon would burn into carbonic oxide and that carbon monoxide must have been there, although not reported on.

Dr. Raymond: I do not remember about the carbon monoxide. The absence of carbonic acid is alleged as one of the clear proofs that fire-damp did not explode, because fire-damp always leaves carbonic acid. With regard to the general theory, I feel I am hampered because I have not stated it with the same fullness that will be found in Mr. Stuart's book, but what I said remains true. Outside of these laboratory experiments I know of no cases where we have had explosions from coal dust, and yet we have had plenty of dusty collieries. If this dust will explode we ought to have explosions nearly every day. I think there must have been some peculiar condition of danger which has been overlooked and I am happy to say that it is not a very widespread danger.

Dr. A. R. Ledoux: It might be interesting to mention an explosion in a sugar refinery at Chicago, where starch exploded. In one of their departments where they were making dextrine by heating starch the room was full of starch dust. The dust settled on some cylinders and would very often grow hot and glow, and it was the duty of one man to watch for fire. This glow would often appear on the top of the retorts, and again and again they put out small fires. One day the superintendent noticed behind one of the retorts that the starch was glowing. He turned a stream upon it and instantly the whole building went up. Fortunately for himself and science the superintendent was not killed, and was able to report this fact. The moment the stream struck there was a whirr, a spark, an explosion.

The following are abstracts of some of the papers presented at the meeting:

THE GENESIS OF ORE DEPOSITS. DISCUSSION OF THE PAPER BY BERGRATH F. POSEPNY, READ AT THE CHICAGO MEETING.

This discussion, which has been entered into by both Prof. Posepny and Dr. Raymond, is quite long. An abstract of it will appear in the columns of the "Engineering and Mining Journal" in a subsequent issue.

ALUNOGEN AND BAUXITE OF NEW MEXICO. BY WILLIAM P. BLAKE, NEW HAVEN, CONN.

In a region about half a mile square, lying 40 miles north of Silver City, N. M., of nearly horizontal strata of volcanic origin, there have been extensive alteration and change by solfataric action, or possibly, by the decomposition of pyrite-producing aluminous solutions, which have suffered decomposition with the production of sulphate of alumina (alunogen) and the separation of ferric sulphate; while the rocks traversed by the solutions appear to be deprived of a part, at least, of their silica and alkalis with the formation of bauxite. The rocks appear to have been originally highly basic volcanic porphyries and basalts.

NOTE ON THE TAYLOR GAS-PRODUCER PLANT AT THE ONTARIO MILL. BY C. A. STETEFELDT, OAKLAND, CAL.

In the paper by the same author on "The Consumption of Fuel in the Taylor Gas-Producer Plants at the Aspen and Marsac Mills," the author stated that in the plant which he had designed for the Ontario mill the gas tubes were to be covered with thin corrugated sheet iron, over which a coating of asbestos magnesia would be spread in order to effect a good insulation. The results of the 5-ft. gas producer have been: Coal consumed in 24 hours, 4½ tons; ore roasted in 24 hours, 40 tons. The 7-ft. producer, with two revolving dryers, consumed 8½ tons of coal in 24 hours, roasted 40 tons of ore, dried 80 tons of ore and 12 tons in salt.

THE STRUCTURE OF THE RICHMOND COAL-BASIN. BY E. J. SCHMITZ, NEW YORK CITY.

This basin comprises about 189 square miles, being from 24 to 31½ miles long, and 5 to 10 miles wide. About one-tenth of this area has been explored, and not over 1,200 acres have been worked near and along the outcrops or edges of the coal. A paper by O. J. Heinrich, on "The Mesozoic Formations of Virginia," gave a complete section of the Triassic measures of this basin, which he has studied from a number of bore-holes, but Mr. Schmitz disagrees as to the theory that this field forms a continuous connection with all Mesozoic deposits along the Atlantic coast. He says that the practical value of the field as a coal-producer depends, of course, on the area which can be opened and made accessible, and it seems to him that the chances are better nearer the center than the edge of the field.

THE INACCURACY OF THE COMMERCIAL ASSAY FOR SILVER. BY C. A. STETEFELDT, OAKLAND, CAL.

The author says that the purpose of this paper is to convince managers of silver mills that their customary reports in regard to the percentage of silver saved are far from the truth. The first and most important error is in the inaccuracy of the commercial assay, and the second in the incorrect sampling of tailings in amalgamation. Again, mills not doing custom work are in the habit of weighing the ore only approximately and without making moisture tests. The losses taking place in the commercial assay are: first, silver remaining in the slag; second, silver absorbed by cupel; third, silver volatilized in the crucible, scorifier or cupel. In

older treatises on assaying preference is given in all cases to scorification, but recent textbooks acknowledge in many instances the superiority of the crucible assay. In a large number of assays tabulated by the author it is shown that in each case the results from the crucible assay were slightly higher than those from scorification.

FRANKLINITE AND ZINC ORE BEDS OF SUSSEX COUNTY, NEW JERSEY.  
BY WILLIAM P. BLAKE, NEW HAVEN, CONN.

In the recent litigation for the possession of franklinite by one party and of zinc ore by another, it was shown by the evidence of experts that at Mine Hill a more or less distinctly defined layer of red zinc ore underlay the heavier and larger body of the franklinite; this layer dipping under the franklinite upon the western cropping, while at Stirling Hill, two miles south, the conditions were reversed, the zinc ore overlying the franklinite.

THE MANGANESE SLAGS OF TOMBSTONE, ARIZONA.  
BY JOHN A. CHURCH, NEW YORK CITY.

The author, in 1879, examined the mines of the Tombstone Mill and Mining Company, and found a bed of tailings containing 12,000 tons, which had a value of 9 to 12 oz. silver to the ton and some gold. The ore had been amalgamated in pans. After considering the results of a test by repanning it was thought advisable to concentrate and smelt, although the material contained only 3% of lead. Limestone was abundant, but no iron suitable for flux could be had. One of the company's claims was an argentiferous manganese ore, which gave but poor results by amalgamation. At that time no smelter had ventured to trust manganese as a precipitant, and it is believed that no other furnace has been obliged to try this method since, and that the manganese practice of Tombstone remains unique among the records of smelting lead ores in the shaft furnace. The first run was made in September, 1882, and the furnace continued, with some interruption, until August, 1887. Its whole record was 1,307 days; 41,626 tons smelted; refined lead, 2,734 tons; refined silver, 914,269.58 oz., and 5,182.02 oz. refined gold. The ores were very irregular, and consequently there was a wide variation in the slag. In some the manganese oxide varied from 12 to 43%, and the silica from 29 to 34%. The author gives a number of interesting tables showing the record of the blasts and percentages and slag assays.

ORE DRESSING AND CONCENTRATION IN SWEDEN.  
BY P. G. LIDNER, NEW YORK CITY.

At the majority of the works in Sweden the ore to be treated is a mixture of blende and galena, with either a fine-grained gray gneiss or limestone as gangue. The object is to separate the two former as concentrates. The ores are difficult to concentrate because the minerals are so finely disseminated in the gangue. The mills are of the German pattern, and Continental methods are prevalent. Before the ore is sent to the mill it is thoroughly overhauled and hand-culled. The most prominent concentrating works in Sweden belong to the French Vieille Montagne Company, and are run in connection with this company's extensive zinc mines at Ammeberg, in the province of Nerike. There is also a smaller plant at Johannesburg, about three miles distant. At Sala, dressing works of modern construction were built in 1880 for the concentration of galena and other silver-bearing minerals of a complex nature. The gangue is limestone, and the galena is associated with other sulphurets, iron pyrites and blende, but not in any considerable quantity. At Saxberg, in the province of Dalarna, a concentrating plant was built in 1891 to treat an exceptionally difficult ore, which is an intimate mixture of galena, blende and gangue. Another concentrating mill of recent date is situated at Hellefors, in the province of Westmanland. The ore is practically the same as that at Saxberg, as also is the mill.

MAGNESIA AND SULPHUR IN BLAST-FURNACE CINDER.  
BY FRANK FIRMSTONE, EASTON, PA.

The experiments carried on by Professor Ledebur, as to the power of various silicates of lime and alumina, magnesia and alumina, and lime, magnesia and alumina, to remove sulphur from pig iron, have shown that the more basic the silicate the greater the quantity of sulphur it will take up, and that this quantity is greatest for the lime-alumina silicate and least for the magnesia-alumina silicate. Much the same opinion has been published by various high authorities. Experience, however, in Easton, Pa., shows that there is no difficulty in making iron low in sulphur, using a normal dolomite. In the case referred to the ore contained from .01 to .09% sulphur, averaging about .03%. The coke averaged from .60 to .75%. For two years limestone used contained: lime, 44.52; magnesia, 5.45; silica, 7.18. After that time a dolomite was used containing: lime, 30.42; magnesia, 20.95; silica, 2.07. The cinder from the first limestone averaged: silica, 39.95; alumina, 5.49; lime, 47.39; magnesia, 5.38;—and from the second cinder: silica, 38.37; alumina, 3.98; lime, 35.18; and magnesia, 19.48. The results show that for the same contents in silicon contained in the iron, that made with the dolomitic cinder contained very much less sulphur. The use of dolomite also appeared to make a material reduction in silicon. The writer thinks that one reason why the use of magnesia in this case has resulted successfully has been owing to the small amount of alumina in the cinder, being little more than half of that in the cinder from British iron works where magnesia gave poor results.

THE LIMITATIONS OF THE GOLD STAMP MILL: DISCUSSION OF THE PAPER OF MR. T. A. RICKARD, READ AT THE CHICAGO MEETING.

Philip Argall, of Denver, says that Mr. Rickard's statement that the gold in Gilpin County is "fine," is vague, as "coarse" and "fine" are only comparative terms. As he previously pointed out, Mr. Argall thinks that the long drop, the roomy mortar, fine crushing and battery amalgamation do not, on the average, save one half the value of gold and silver in the ore. In this opinion the whole system is wrong from the standpoint of present conditions. Fine crushing he says is not conducive to close saving by concentration, and suggests that coarse crushing and concentration should precede fine crushing and amalgamation.

As to whether vibration of stamp-stems changes their molecular structure, Dr. Raymond states that it is not settled that vibration will crystallize iron under any condition, but Mr. Argall says that while admitting that authorities differ as to the possibility of the cold crystallization of iron he believes it is a settled fact that vibration in the presence of heat will do so. In his previous

discussion upon the same subject he stated that "vibration under all such conditions," that is, vibration attended with sharp blows, such as a stamp-stem is subjected to, will crystallize iron. He refers to numerous authorities favoring this view. Dr. Raymond in further discussing Mr. Argall's statement, says that as the latter has confined the proposition to such vibrations as take place in stamp-stems, it greatly narrows the field of inquiry. As to whether vibration will or will not cause crystallization which may result in the fracture of stamp-stems, he quotes a number of authorities who consider it doubtful whether vibration caused by impact will induce a crystalline arrangement, which did not previously exist. Both Dr. Percy and Prof. Ledebur take this view. As regards the vibration crystallizing a heated iron, Dr. Raymond says that he refers only to the cold metal, as that is the condition in which it is in stamp-stems.

THE RINGWOOD IRON MINES, NEW JERSEY.  
BY FRANK L. NASON, NEW BRUNSWICK, N. J.

The magnetite iron-bearing rocks of the Archæan highlands of New Jersey, New York and Pennsylvania belong to the Mount Hope type. This rock consists essentially of orthoclase and plagioclase feldspar, grains of quartz and occasionally octahedral crystals of magnetite, as well as numerous grains of the same mineral. The accompanying minerals are zircon, rutile and molybdenite. Interstratified with the Mount Hope rock at Ringwood are found the iron-ore deposits. Associated with them are highly basic rocks composed of pyroxene and hornblende. The position of the ore bodies in the rock is that of exact conformability with the planes of stratification. The strike is generally northeast, with a dip to the southeast varying from 40° to 90°, and a northeast pitch from 0° to 75°. The ore bodies are usually lenticular deposits, or "shoots" as they are termed by the miners. From the study of the Blue, Little Blue, Cannon, London, New Cannon, Bush and St. George mines it has been learned that the central part of the lenses usually carries the more solid ore. At the upper and lower edges, especially the lower, the ore is gradually replaced by heavy basic metals, such as black pyroxene, hornblende and biotite, with thin stringers of iron ore. At these edges and at the contact of the lenses with the foot-wall, the ores begin to be, in many places, heavily charged with almost pure phosphate of lime, in compact granular masses. The thickness of the ore-bodies or lenses, measured from foot to hanging wall, varies from 6 to 50 ft. At the Blue mine group the mine rock is shattered and broken; the ore shoots are faulted and slipped, and are bent aside from their normal strike for short distances. The crevices of the shattered mine-rock are filled with coarse pegmatite granite. The surrounding country-rock is also much broken and is displaced by granitic rocks. The author says regarding the structure of these mines that the Blue mine group lies in a tightly compressed synclinal fold which pitches to the northeast; the St. George and Keeler mine lie on the western slope on an anticlinal fold, and the Peters mine group lies on the western slope of a syncline. These folds are overthrow folds, so that all of the mines are either vertical or have a southeast dip. It is further shown that the Blue mine group is broken by a fault, and that probably none such exists in the Peters group. The thickness of the iron-bearing strata is upward of 600 ft.

A UNIFORM ASSAY OF COPPER MATERIALS FOR GOLD AND SILVER.  
BY ALBERT R. LEDOUX, NEW YORK CITY.

The writer expresses the wish that some uniform method for assaying these materials could be arrived at, and speaks of the movement initiated by Prof. J. W. Langley, of Pittsburg, in 1888, which resulted in the general adoption of standard methods in the determination of carbon and other important elements in iron and steel. In discussing the question it is noted that there is a divergence in the methods usually employed in the East and West. Some of the Eastern public assayers used the wet method, which consists in taking one assay-ton of copper borings or matte in a No. 5 beaker. The sample is treated with a mixture of 100 c. c. water and 50 c. c. nitric acid of sp. gr. 1.42. When the violent action has ceased 50 c. c. more of nitric acid is added, and the solution heated until everything soluble is dissolved. It is then boiled until the free nitric acid is expelled; then is diluted with 400 c. c. water, 5 c. c. sulphuric acid and 10 c. c. concentrated solution of acetate or nitrate of lead. The precipitate of lead sulphate is allowed to settle, filtered and washed, and the filter and its contents are partially dried, wrapped in thin lead-foil and transferred to scorifiers. Cupellation is conducted in the usual manner. This method is intended for the determination of gold, but enough silver may be present to allow the bead to be parted. For silver the usual method in the East is to dissolve the sample in dilute nitric acid, as described above, and, before adding lead acetate, enough chloride of sodium is added to throw down all the silver. The rest of the process is conducted as for gold. In the West, the all-fire method is employed almost exclusively. At one works 10 portions of the samples, of  $\frac{1}{10}$  assay-ton each, are scorified with 50 gm. of test-lead; 1 gm. of borax is added and the lead buttons obtained are cupelled separately, but the 10 beads are weighed together. The cupels are then ground up and fused with 90 gm. litharge, 50 each of borax glass and soda, and 3 gm. argols. The silver obtained is added to that secured in the first assay. All the beads are then parted for gold. Each of these methods, in the hands of assayers skilled in its application, will produce fairly uniform results. Yet any assayer running the two, side by side, will get divergent figures for gold. Without discussing the subject further, the author proposes a plan for the co-operative action of members of the Institute engaged in this business. He proposes that a number of samples of gold and silver bearing copper material should be distributed to as many assayers as are willing to go in, each to send his results together with a minute description of the method employed to the secretary of the Institute.

THE ORE-DEPOSITS OF BUTTE CITY.  
BY R. G. BROWN, BUTTE, MONTANA.

This paper presents a general description of the different mineral belts in the Butte City region, covering the copper and contiguous silver veins. The mining district is about seven miles long from the continental divide on the east to the gravel flats beyond the Blue Bird on the west, and about four miles wide. The country rock is dark syenitic granite in the east, and pale acid granite in the western portion. The region divides itself naturally into a northern and southern silver belt and a copper belt.

the latter partly contained between others and containing in turn a silver belt.

Characteristic of the northern silver belt is a manganous and silicious gangue, showing frequently blackened outcrops of great prominence. It is characterized by many faults, some of which appear along the strike on the surface, while others are developed by underground workings only. The dip is northerly in the western portion, and southerly in the eastern. Southward from the Southern silver belt there are several lines of manganese outcrops which break across Missoula Gulch. The veins are characterized by scanty croppings of brown quartz under a wash so thin as to insure their early discovery and exploitation. The middle silver belt is rather remarkable as it projects itself into the heart of the copper country north of the Gagnon-Original-Parrot system. It terminates in a point near the eastern end of the Stewart claim. The ores of this belt are of higher grade than those of either of the silver belts, though this is not so noticeable on the western end. They are characterized by their high gold values, reaching 2 oz. gold per 100 oz. silver in the best regions. The copper belt is of greater importance, economically, than all of the rest. It is about 3,000 ft. wide at its western end, and

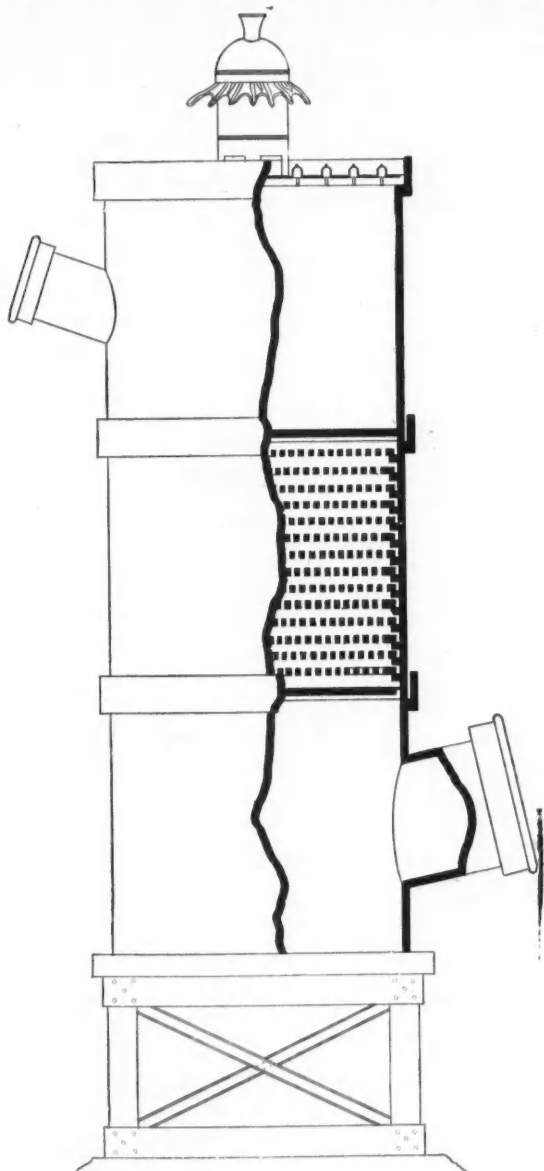


Fig. 1.

some 7,000 ft. at its eastern part, before it sinks under the heavy granitic sands 10,000 ft. to the east. In general, the strike of the copper-lodes is east and west, dipping south 10° to 15° from the vertical. The lodes are very irregular, in many places having no defined walls, the only distinction between veins and country-rock being a commercial ore, based on shipping value. The ore occurs in shoots that "finger" or "pinch" out along the strike. The lenticular form is not so characteristic of the larger bodies as of the smaller. The veins vary in size from a foot or two up to 100 ft. or more. Ten-foot stopes are common, and 20-ft. stopes by no means rare. The surface indications of these copper veins are noticeable outcrops of dark red or brown quartz. Just below the surface this is associated with soft red and yellow iron oxide, carrying high values in silver and gold, but low in copper.

Density of Melted Magnesia.—While endeavoring to determine the density of melted magnesia, M. Henri Moissan arrived at the conclusion that the density of this substance increases with the temperature up to bright red. It is thus that by heating in his electric furnace some magnesia, which is irreducible by heat, M. Moissan has been able to vary the density from 3.193 to 3.654. This is all the more noteworthy as this substance affords the only example of such a variation.

THE LUNGE-ROHRMANN ROUND STONEWARE PLATE COLUMN.

Through the courtesy of Mr. H. J. Davis we are enabled to present illustrations of the new round stoneware plate column on the Lunge-Rohrmann system, invented by Dr. Lunge, of Zurich, Switzerland, and Mr. Ludwig Rohrmann, of Krauschwitz, Germany. The latter is the well known manufacturer of stoneware for chemical purposes, his clay making a stoneware unusually strong and entirely unaffected by acids or heats.

This column, which has been patented in all countries, has, it is stated, double the area of any similar column heretofore made. The increased area of the plate allows, therefore, a greater number of holes for the gas and liquid.

The Lunge-Rohrmann columns have been adopted in Europe for the manufacture of hydrochloric, nitric, phosphoric and acetic acids. They are also being used largely by some European governments in the manufacture of picric acid which is used as an ingredient of smokeless powder. One of the largest works in Germany now using the column has obtained an average of 183 to 190 parts of hydrochloric acid of 20° Beaume for 100 of salt dissolved. In the manufacture of nitric acid, these plates give excellent results, especially when used in connection with the Griesheim process of nitric acid manufacture. The cylinders as shown in the cut are entirely of earthenware, as are also the plates. In the old style of round tower ring bearers were used to separate the plates from each other; these are now superseded by lugs being cast on the inside of the cylinder "A,B," which not only materially reduces the cost of the column, but also increases its capacity and efficiency. The plates for hydrochloric acid contain perforations somewhat larger than those for the manufacture of nitric acid. The holes in the plates are not directly underneath each other, but alternate so that it is impossible for the liquid to pass through more than one plate at a time. These columns are connected with the earthenware worms and the receivers by pipes of the same material, and any degree of condensation can be accomplished that may be desired. The towers can be adapted to the condensation and absorption of any gas. Fig. 1 is a part section and part elevation of a tower, and Fig. 2 is a horizontal section.

For sulphuric acid the same style of plate is used, but instead of the round column, one about 2½ ft. square is used, part of which can be placed in sections so that the capacity of the acid tower can be made whatever is required.

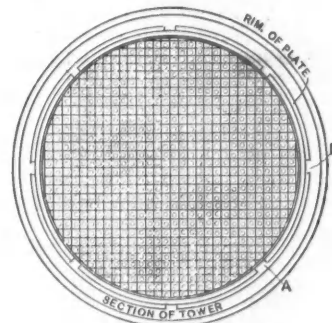


Fig. 2.

THE LUNGE-ROHRMANN STONEWARE PLATE COLUMN.

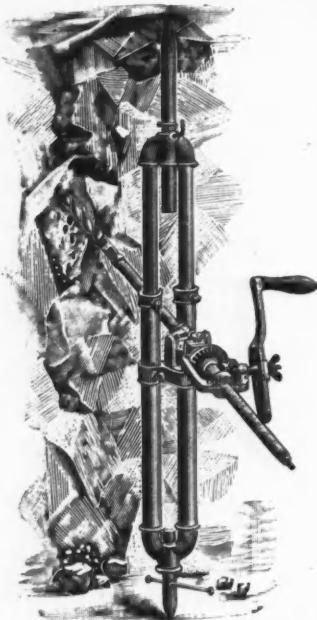
A chemical firm in Germany is now constructing a sulphuric acid works without any leaden chambers whatever, using entirely the square Lunge-Rohrmann columns for the condensation of the sulphurous gases. In these works there is erected a Glover tower somewhat larger than the ordinary style, but not so high, packed with refractory material that admits of a very high degree of heat, which is utilized in condensing the acid to a comparatively high degree. After leaving the Glover tower there is a supplementary tower of plates which is so constructed that the gas passes through it before being introduced into the main set of columns. The Gay-Lussac tower is also made with the plate columns so arranged that its action is said to be very complete.

Determination of Silica in Furnace Slag.—P. W. Shimer, in the Journal of the American Chemical Society, says that, when fluxing aluminous ores with magnesian limestone, spinel is very apt to be found in the slag, especially when the slag is basic, the alumina in this case acting as an acid and combining with part of the magnesia to form magnesium aluminate. In the determination of silica in such a slag by the method of fusion with alkaline carbonate, the spinel seems to be almost wholly unattacked by the fusion and subsequent evaporation with hydrochloric acid, and is weighed with the silica at the end of the determination. In the case of one slag, the silica, before purification, was 34.25%; after purification with sulphuric and hydrofluoric acids, it was found to be 31.52%. The bluish-colored residue left after the sulphuric and hydrofluoric acid treatment was found to dissolve easily in fused potassium bisulphate, and contained alumina and magnesia in the proportions necessary to form spinel. In the case of another slag, the silica, before separation of spinel, was 39.23%; after separation, 34.73%. The points it is desired to bring out are, that spinel is not decomposed by the usual alkaline carbonate fusion, and therefore that it is never safe to omit the treatment of the silica with sulphuric and hydrofluoric acid. All the slags in which spinel was found were stony slags, and therefore had the usual time in which to cool and crystallize. It is quite possible that, if the same samples had been chilled, the elements of the spinel would have remained in decomposable combination with the silica. However, even in the case of chilled samples, the possible presence of minute crystals of spinel should not be ignored, especially in basic slags rich in alumina and magnesia. By successive and repeated treatment of 100 grms. of a powdered spinel slag with hydrochloric and hydrofluoric acids, and boiling solution of sodium carbonate in a platinum dish, it was found to be possible to separate 1 gm. of microscopic crystals of spinel quite free from all impurities.

## THE McNELLY MINING DRILL.

The accompanying illustration shows the McNelly double post mining drill, which has been introduced to a considerable extent in coal and other mines. The machine, as shown, consists of the post, with boxing to carry the screw and auger, a steel screw for driving the auger, the auger, and side gear for imparting the motion. Three augers, 2 ft., 4 ft. and 6 ft. long respectively are made for each drill. The posts are made of extra strong pipe, and are made so as to telescope together. This enables the operator to lengthen or shorten the machine easily and quickly, it being held at any desired height by set screws. The connecting parts of the posts are all made of malleable iron, strong and durable. The boxing is long, giving it strength, and saving wear. It rests upon a sliding bridge, which can be raised or lowered in the post at will. This is a valuable feature in this machine, as when the bottom is soft the post is liable to settle and thus cause the auger to bind in the hole, often requiring a resetting of the post. A post machine is liable to settle. In this machine this trouble is overcome, as with the jack-screw it can at once be tightened, and the sliding bridge adjusted so as to relieve the auger from any friction, however slight. The driving screw is made of the best steel, as also the augers, which are fitted and sharpened ready for use.

This machine is adapted to all kinds of mine work, and especially for lifting bottom or taking down roof, as it can be worked at any angle desired, and is easily and quickly adjusted. For close work it is particularly suited; and with side-gear, can put a hole within 2 in. of the rib. The gear can be used on either side, or on top, or directly under the driving screw, and can be changed from one position to another instantaneously.



McNELLY DOUBLE POST MINING DRILL.

The chief advantages claimed by the manufacturers for this machine are: It will drill high or low, at any desired angle or elevation, and close to the rib, and can be quickly and easily adjusted; it is light, and easily moved from place to place, and it can be operated by a boy as well as a man.

This drill is made by Wm. McCune & Co., Sterling, Ill. It is made ordinarily in three sizes: No. 0 for mines 3 to 5 ft., No. 1 for mines 3 ft. 8 in. to 7 ft.; and No. 3 for mines 4 ft. 4 in. to 8 ft. Other sizes can, of course, be made, to fit any mine.

## DEEP LEVEL MINES ON THE WITWATERSRAND.\*

On what are known as the "Deep Level" properties in the Witwatersrand—that is, the explorations made to reach the great banket view at the depths where the diamond drill explorations showed that it could be found—considerable progress has been made. On September 1st three shafts had reached depths of over 700 ft., the Henry Nourse No. 1 being down 969 ft., the Crown Deep Level No. 1 reaching 843 ft., and No. 2 of the same company 799 ft.

The striking of the reef in the Nourse Deep Level property is another proof of the persistency and extent of the conglomerates. A few miles to the eastward in the Geldenhuis Deep and the Simmer & Jack the reef has been found in shafts put down several thousand feet south of the outcrop, and it has been argued that this permanence was due to the flat dip of the reef—about 30°—in that section of the Rand, as the igneous rock, which is supposed to underlie the whole formation, was not reached. In the outcrop company of the Nourse Deep the reef is inclined at a very high angle—some 70° or 80°—and the deep level shafts have been sunk not far from the outcrop. In one of these the reef has been cut 2 ft. wide at a depth of 967 ft., and is at this depth in every respect identical with the reef worked at the surface.

The shaft in which the reef has been struck is in the eastern portion of the property, and is known as No. 1 shaft. It has been sunk without the aid of a pump and without rock drills, in 24 months, the surface having been broken July 25th, 1892. A good deal of the time has been wasted owing to water and other difficulties.

The first 100 ft. was sunk by windlass, and then two boilers, equal together to 40 H. P., were erected at the shaft to supply steam to a Tangye geared hoisting engine, with 10 in. x 20 in. cylinders. This has also, until lately, driven a saw bench. The sinking has been done by contract, the present price paid being \$33.60 per foot, the contractors supplying

\* Abstract from article in the "South African Mining Journal."

everything, including explosives. Hauling of ore and water is done by the company. A good deal of water was met with, a spring being struck at one point which is still running strongly, and gives about 25,000 galls. in the 24 hours. This is all baled into the skip, which up to now has been found equal to the work, but it can be understood that this has added to the cost of the work. The shaft is 5 ft. x 9 ft. 6 in. inside and 12 ft. x 7 ft. outside measurement. The work is done by native labor, and is interesting as showing what can be done by native miners. They work in shifts of eight hours and are required to first clean up the loose rock, a work which occupies about two hours. If drilling single handed a boy\* is required to drill a hole from 3 to 4 ft. in depth; if double handed two holes averaging 7 ft. must be done. Practically they work in a naked condition, drenched by the water pouring down upon them. The best boys are paid \$19.20 for 28 days actually worked. The best record was made in July, when 61 ft. were sunk. Comparing this with rock drills it will be seen that while these are more rapid, hand labor is less expensive.

This No. 1 shaft has been regarded as an exploratory shaft, and consequently has not been properly equipped with machinery. At No. 2 and No. 3, about 900 ft. apart to the westward, first-class plants have been put up. At No. 2 shaft, which is 5 x 15 ft. in the clear, there is an 8-in. Cornish pump driven by a large Corliss compound tandem condensing engine of about 140 H. P. Part of this power will probably be utilized for other purposes. The foundations of the compressor plant, which will be erected beside the pumping engine, are ready, and the pipe connections, which will enable the water from the various shafts to be utilized for cooling and other purposes, are being made. A large quantity of water has been met with and Mr. Donald has been careful to make very complete arrangements for dealing with it. In No. 2, which is 612 ft. deep, there are two plunger lifts, and at 320 ft. a reservoir capable of containing 10,000 galls.; another water catch at 540 ft. will hold 9,000 galls. The country being hard quartzite these tanks represent a considerable expenditure of money and labor, but as the bulk of the water is met with in the upper levels, no further delays and difficulties on account of water may be expected. There is a powerful hauling engine of about 70 H. P. with 14 x 28 cylinders at this shaft. The drums are 9 ft. in diameter, and a hauling speed of 25 ft. a second can be attained.

No. 3 shaft has been furnished with a similar hauling engine with cylinders 14½ in. x 28, and small winches have also been provided for dealing with the weighty work. The pumping engine is a single cylinder 25 H. P. from Messrs. Tangye, who have supplied most of the driving machinery on the mine. There are two plunger and one drawing lift, and a reservoir to contain 7,500 gal. in this shaft, which is now 608 ft. deep, the record sinking for any month having been 54 ft., as against 60 ft. in No. 2 shaft.

The surface works will be very complete, and the buildings required for the shops and workmen's quarters are already up. The shops are under one roof, the smiths' shop being 100 ft. in length, the fitters' 60 ft., and the carpenters' 40 ft., the building being 40 ft. wide. Adjacent a timber yard is being built 200 ft. by 100 ft., and in this all heavy stores and machinery will be kept instead of lying about all over the surface, as may be seen on so many mines. The workmen's rooms are 64 in number, to accommodate 128 men, and in addition a large reading-room has been built. For the natives a roomy and substantial compound of stone has been put up, containing a cooking-house in the center of the yard. It has 13 rooms, and can accommodate 300 boys.

As regards the battery equipment this will be similar to that on the Geldenhuis Deep. Two Fraser & Chalmers boilers of 100 H. P. each have been already put up to supply steam to the present plant at No. 2 shaft, and the number will eventually be increased to 10, which will supply 1,000 H. P. The stack will be 135 ft. in height and 8 ft. 6 in. in diameter, and an economizer will be provided. On the west of this boiler-house the stamps will be erected, as it is intended to make No. 2 the main shaft for exploiting the mine.

Mr. James Donald, who gained his mining experience in California, has had control of the work, and besides doing it well and thoroughly, he has been careful to attend to the appearance of it as well, with the result that his mine is one of the cleanest on the fields. The engine-rooms are spacious and spotless, and even the working beams of the pumps kept clean and bright with paint, and the bob and excavations free from dirt and rubbish. These little details are not attended to on many mines, the Cornish pumps in particular being left to take care of themselves, with the result that the pits for the working beams are bins for dirt and refuse. On the Nourse Deep the same cleanliness is observable everywhere, all trenches being filled and stones and dirt removed, while a separate yard will be built in which to store surplus or old machinery. It is a pity that managers generally are not more careful in keeping the surface clean and clear of dirt, for some of our best mines are littered with heaps of refuse, while old and discarded machinery lies rusting in every direction. A pump or engine put out of work is usually allowed to lie outside exposed to the weather, and if it cannot be immediately sold it becomes in short time practically valueless. This carelessness often extends to the mine, and the result is seen in slovenly, untidy and dangerous timbering.

Nitrate of Cobalt.—A Hungarian chemist, Johann Antal, has discovered a new mineral, the nitrate of cobalt, which is believed to be an effective antidote in cases of poisoning by cyanide of potassium or prussic acid. Tried upon a number of animals, it has been used in this way successfully in over 40 cases, most of them of accidental poisoning.

Speed of Vessels.—According to some figures collected by London "Engineering," out of 12,907 steam vessels registered at Lloyd's, only 304 claim a speed over 15 knots an hour. Only 45 ships have exceeded a speed of 19 knots during the last five years, and 18 only have done better than 20 knots. Of these 18, four are Belgian side-wheel steamers employed on the line from Ostend to Dover, two are French side-wheel steamers in service between Dieppe and Newhaven across the Channel, two are American, the "Paris" and the "New York," and the other ten are English. Of the 45 ships which have a record of over 19 knots, 22 are side-wheel steamers, 16 twin screws, and seven have only a single screw.

\* In South Africa a native laborer is a "boy," without regard to age, so that the boys here referred to are grown men—but black.



THE GEORGETOWN MINING DISTRICT, MONTANA.

Written for the Engineering and Mining Journal by R. G. Brown

On Professor Hitchcock's geological map of the United States there is shown a belt of Archæan rock, reaching from 117° west longitude, on the northern edge, in a southeasterly direction, so that it crosses the 47th parallel at 115°, and the 45th at 113° west longitude. Between these two intersections a tongue of granite, scarcely five miles wide, darts to the northeast perhaps 50 miles, into the heart of the Paleozoic rocks, which are shown on the map referred to as 150 miles wide at this point. Closely west of this granite tongue is the old gold camp of Georgetown, Mont., 18 miles northwest from Anaconda, and 12 miles southeast of Phillipsburg. A sketch map of the district is given herewith.

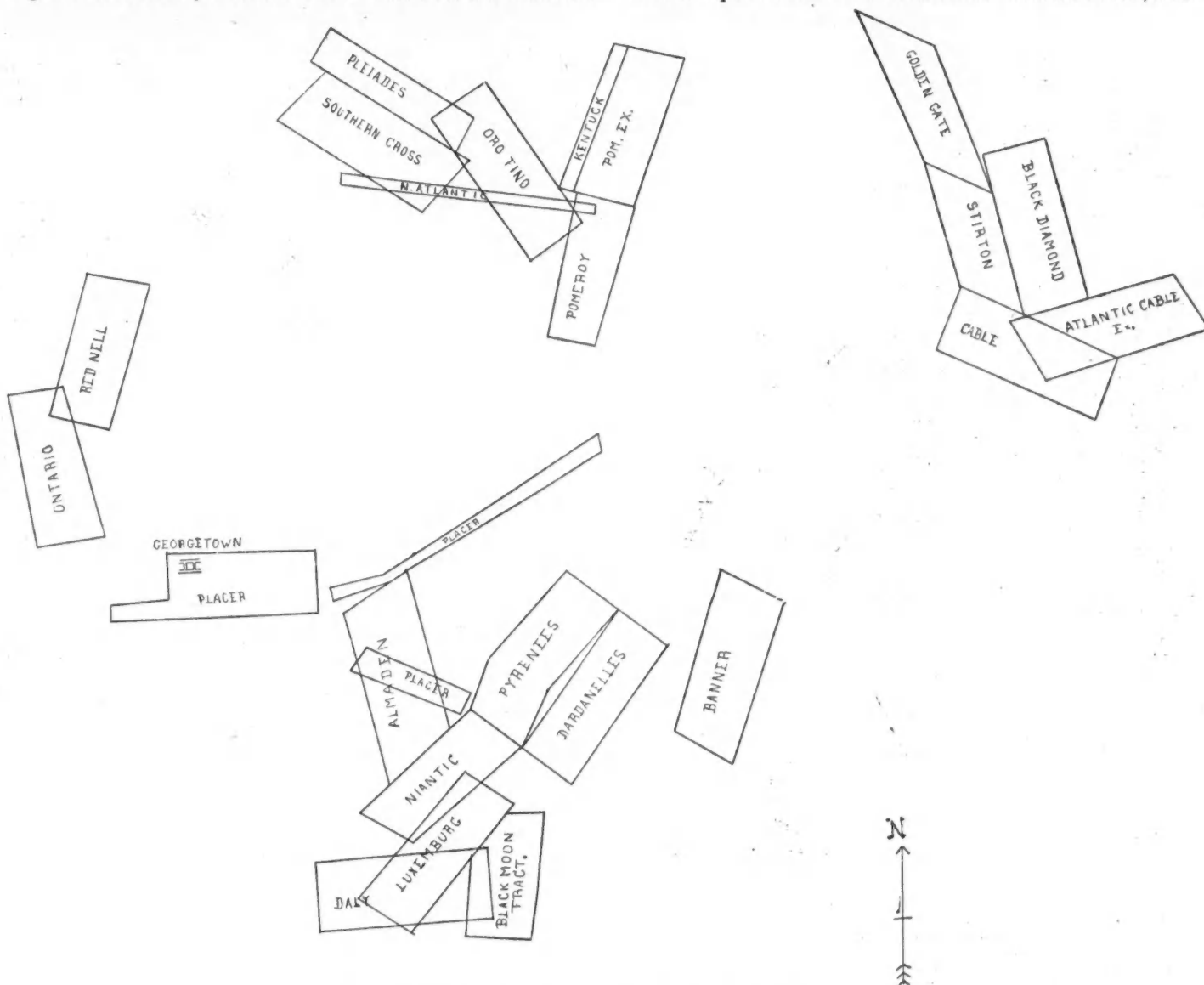
It lies at the mouth of a gulch on the eastern skirt of Georgetown Flat, a great expanse of meadow, plentifully watered and sometimes swamped by streams and springs. The gulch is the scene of past placer work, and its gravel has been many times turned over. Across the head of it lie the

The Pyrenees vein—and it stands for the others in the granite so far as they are explored—is a fissure, to use a familiar, if misleading, term, with characteristics of gangue on foot-wall, local pinches and bonded structure. There are several local bonanzas 4, 8 or 10 ft. thick, but the width averages below 3 ft. Its strike is such as to cause an intersection with the contact to the south, where the vein is not cut off in that direction by a vertical, dyke-like mass of limestone reaching up from the limestone country; beyond this it has not been determined.

The surface ore is a brown iron, with stained quartz, the base ore pyrite with barite and quartz gangue. An interesting fact to be noted in reference to the free-milling and base rock is that the line of change borders upon the vertical, with a slight dip toward the lime dyke, so that this dyke must be a drainage seam for the mountain.

Closely grouped with these claims are others (see map), on all of which considerable prospecting has been done, resulting in some shipments of ore; but in the Pyrenees alone has base rock been reached.

Another important mine of the district is the Southern Cross, three-



SKETCH MAP OF THE GEORGETOWN MINING DISTRICT, MONTANA.

Pyrenees and Niantic claims, on which the deepest work in the district has been done. The shaft on these claims—they are under one ownership—is 300 ft. deep, and reaches base ore, a pyrite, with quartz and barite gangue. The property was a good producer until the increase of the sulphides rendered the old stamp mill useless.

But to return to the geology of the region. The road from Anaconda runs up Warm Springs canyon; this is a deep gash in much altered limestone, showing moderate contortions of stratification, which are to be easily traced by the casual traveler in the dark lines of the coal measures, wavy bands of black or gray in strong contrast with the light limestone. Here and there along the canyon there has been a good deal of prospecting, and several silver-lead deposits have been worked in a desultory fashion, with co-ordinate results. At Cable, two or three miles southeast of Georgetown, the road has left the Paleozoic limestones for the Archæan tongue of granite referred to above, which it exchanges again for limestone above Georgetown.

Georgetown, then, is on limestone; and the Pyrenees, half a mile above it, in granite, of an undetermined variety. Striking diagonally up the hill to the right and obliquely across the gulch, is the line of contact. It is marked by a deposit of brown iron ore, reaching a width of 40 ft. or more, in which large boulders of limestone occur. This ore is of the familiar "burnt" appearance, and barren so far as developed, which has been done in many places and to respectable depths.

quarters of a mile from Georgetown and a mile from the Pyrenees. This is on the lime side of the contact. It has been opened to 250 ft. and shows a considerable ore body, but fails of the characteristics of a fissure, seeming rather to be a chamber of oxidized iron in limestone and largely contaminated with the country rock. Considerable trouble has been experienced in the treatment of this ore, both milling and a modification of the cyanide having proved unsatisfactory. Grouped with the Southern Cross are the Oro Fino, North Atlantic and others, of identical character, but behind it in point of development. The Oro Fino is considered the most promising of these, and recently a run has been made on its ore in the Cameron mill. It is through this mill, which lies down the hill from the Southern Cross, that the greater part of that mine's ore has been run and here that the cyanide process was attempted.

These mines are all on the southwestern slope of Cable Mountain, on another flank of which and a mile to the eastward is the famous Cable mine, named for the Atlantic cable, which was laid in the year of its location.

This mine is outside of the limits assigned to the present article, but a word or two concerning it will not be uninteresting. The Cable ore occurs in a dyke of limestone 100 to 300 ft. thick, which is, in turn, contained in granite. The ore was found—the mine has been idle several years—as chambers of pyrite and galena, which were prospected for with the diamond drill. The ore, though bare, milled freely. The mine has been

phenomenal as a producer of gold specimens, one particular mass having sold for several thousand dollars, but, beyond this, it was a steady producer up to the time of its closing down, its output having exceeded a million dollars.

Southwest of the Pyrenees and south of Georgetown, on the point of the ridge that swings round toward the flat, is one other deposit of geological interest from its uniqueness in the region. This is a deposit of honey-combed, slightly stained quartz, frequently in crystals. It has as yet but a geological interest. This perhaps is accentuated by the occurrence of deposits of the normal character near by. It is not shown on the map.

One silver-lead property (the Ontario) has been partly developed in the flat, but great quantities of water forced suspension of operations.

Georgetown now is about as dead as a camp can be and live, but there is, notwithstanding, quite a little prospecting being done on the hills, particularly in the limestone, and a few leasees are picking up what shreds and patches of ore they can find.

#### PRACTICAL TRIAL OF THE SOLAROMETER.

Specially Communicated to the Engineering and Mining Journal.

The practical trial of Beehler's solarometer, which was described and illustrated in the "Engineering and Mining Journal" of August 18th, has resulted favorably. The instrument was placed on the North German Lloyd steamer "Weimar," sailing from Baltimore to Bremerhaven and return, giving 25 days' trial, during part of which there was a rough, choppy sea.

The solarometer worked admirably throughout; the ship's latitude, longitude and compass errors were determined 169 times by observation of the sun and stars at all hours of the day and night, with accuracy. The officers of the "Weimar" took 46 of these observations and Lieutenant Buhler took the remainder. The degree of accuracy was the same as they obtained with the sextant when they were able to use it for observations of the sun. At night the sextant could not be used to observe the stars because the horizon was not visible, so that at those times there was no check on the accuracy of the determinations by the solarometer except that indicated by the instrument itself and the run of the ship as estimated; in Chesapeake Bay and the English Channel where the light-houses and known points on land also established the position of the ship, the results by the solarometer agreed perfectly with the bearings of those points, so that there can be no doubt of the accuracy of the instrument.

The instrument was taken to Paris and explained to Mr. Gautier, the French instrument maker, who has a contract to make them in Paris. It was then exhibited at the Ministry of Marine and Colonies to the French naval officers on duty there, and then at Hamburg, where it was explained to the German naval officers, professors and astronomers at the German Naval Observatory; all of whom expressed their approval of its principles and their admiration of its mechanical design. The directors of the North German Lloyd Steamship Company have ordered one made in Germany for their use.

The six solarometers being built by Mr. G. N. Saegmuller in Washington are nearly finished, and some of them will be delivered to the Navy Department by the end of October; one will be sent by the steamer "Weimar" to Europe to serve as a model for the construction of duplicates in England and other countries. It is expected that the other three will be mounted on trans-Atlantic steamers from New York.

#### RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

##### SUPREME COURT OF UTAH.

##### Sufficiency of Description of Notice of Claim.

Trees blazed and squared, rock monuments, and the prospect hole are permanent objects, within the meaning of the statutes requiring the notice of the location of a mining claim to describe the same by reference to some natural or permanent monument. The fact that the calls in such a notice mention stakes, when in fact the monuments are trees cut off about 3 ft. from the ground, and blazed and squared, is immaterial. The fact that the location of a mining claim, as marked on the ground, is 300 ft. too long and 50 ft. too wide—the statute providing that a claim may be located 1,500 ft. × 600 ft.—does not render the location void, where the excess was included through mistake and in good faith, and the notice posted on the claim stated that only an area of 1,500 ft. × 600 ft. was claimed, and gave the point of beginning and direction of the boundary lines.—Hanson vs. Fletcher, 37 Pacific Reports 480.

**Petroleum as Fuel.**—After a protracted consideration, the Russian Admiralty have resolved upon introducing petroleum as a fuel for warships. The new armored cruisers "Rostislaw" and "Rossia," the former building at Nicolaieff and the latter at the Baltic Ironworks, will be the first battleships fitted with petroleum furnaces. No other vessels will be similarly fitted for the consumption of naphtha fuel until its merits have been fully tested in the two ships above mentioned.

**Shipments of Swedish Iron Ore.**—The shipments of Gellivara iron ore from Lulea, the port terminus of the Gellivara Railway, during the present year, up to end of July, amounted to 277,000 tons. Of this total, 56,400 tons belong to May (first shipment, May 11), 115,000 tons to the month of June, and the balance to July. For the shipment of this quantity, 129 vessels have been employed. The largest cargo was shipped by the Norwegian steamer Loostakken, viz., 4,670 tons. The increase in this year's shipments is, no doubt, due to the arrangement made by the Gellivara Mining Company, viz., that the company hire the steamers for whole or part of the period when Lulea is open, whereby they are far better able to regulate the whole concern. The conveyance of ore from Gellivara to Lulea is now done by three double trains every day, each train comprising from 30 to 38 wagons. The railway freight is 3 kr. 70 ore, or a trifle above 4s. per ton.

**The Mexican Boundary.**—Col. B. W. Barlow, chief of the American Commission to resurvey and erect monuments on the boundary line between the United States and Mexico, has arrived at San Francisco, Cal., having concluded the work in which he has been engaged two and a half years. The distance surveyed was 700 miles from El Paso, on the Rio Grande, to the Pacific. Colonel Barlow says that originally 52 monuments were erected along the line. The commissioners found that only 88 remained. They rebuilt the others and erected 200, making a total of 258. In one section no monuments were found for over 100 miles. In another place a monument was found a mile south of the true American line. This mile strip extended for 33 miles. There were some inaccuracies in the survey, but they were not important enough to change the monuments. The Mexicans were satisfied with the apparent boundary and let it stand.

**South African Nitrate Fields.**—Dalziel's correspondent at Cape Town sends the following account, given by a correspondent of the Prieska (Cape Colony) nitrate fields: The nitrate beds at Prieska present the most valuable and richest deposit of nitrate of potash ever found. It is a most valuable substance, not to be confounded with sodium nitrate or Chilean saltpetre, so largely exported from South America and sold on the London market at £10 per ton, whereas the average price of unrefined potassium nitrate is £16 10s. per ton. The yield of the farms prospected is virtually unlimited, and, while in many of the large kloofs enormous masses of practically pure salt are found, the average in the soil for the whole area may be calculated at 25%. Attention need only be drawn to the working of nitrates in other countries to prove the richness of the most recent South African discovery. Soils containing nitrate of potash are worked in India and Ceylon when containing only 2½ to 5%, and the richest deposits in those countries rarely contain more than 8%, while in Hungary nitroferous soils containing ½ to 3¼% are worked at a profit. The deposit here is most easily extracted, merely by lixiviation, or hot or cold water decantation of the clear liquor from the soil into shallow tanks, and evaporation by the rays of the sun, when practically pure nitrate crystallizes out. By this process nitrates on a large scale could be produced at less than £2 per ton, and the cost of transport over 140 miles of country to De Aar, and thence by rail and sea to Europe, is £5 per ton.

**The Stoichiometry of the Ions.**—An important contribution to our knowledge of ion migration appears in the "Zeitschrift fuer Physikalische Chemie," xiii., pp. 191-288, under the signature of G. Bredrig. After reviewing all that is definitely known about this migration, the author gives a table for the conversion of the conductivity value of a solution at various degrees of dilution into that at infinite dilution; this depends only on the product of the valencies of the ions and not on their nature, and its validity is shown by a comparison of calculated numbers with those obtained by Kohlrausch. To the available data which Bredrig collects, he adds a large number of conductivity numbers obtained from his own investigations, more especially in the case of organic bases, the conductivity of about 150 substances having been determined by means of an alternating current and telephone. In all, about 300 substances were available for discussion. From these data, using the value of Nernst and Loeb for the velocity of the silver ion, the velocities of about 300 ions are calculated, and then by means of the table the conductivity of the substance. In almost all cases the agreement between these numbers and those found experimentally is very good. The ion velocities are in all cases given in mercury units, so that for conversion into C. G. S. units they have to be multiplied by 110 by 10<sup>7</sup>. From these results Bredrig deduces the following relations: The velocity of the elementary ions is a periodic function of the atomic weight, the curve being also very closely analogous to that for internal friction. In complex ions the velocity is largely and additive property, isomeric ions of analogous constitution have equal velocities, and to a continuous additive change in the composition of the ion corresponds a continuous but decreasing change in the velocity. In general a retarding effect on the velocity is produced by substitutions.

#### 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, OCTOBER 23, 1894.

- 526,708. Well Drilling Apparatus. Stephen A. Horton, Clarksville, Tex. Coupling with detachable telescoping members for connecting the drill bit to the drill tube.
- 526,711. Miner's Safety-Lamp. Lewis Jenkins, Handsworth, England. An oil reservoir and burner, with two glass tubes and a frame supporting the tubes and a gauze barrel surrounding the whole.
- 526,737. Apparatus for Burning Liquid Hydrocarbons. William R. Pearson, St. Louis, Mo. Combination of oil supply pipe, retort and surrounding jacket intended to concentrate the flame.
- 526,762. Hydraulic Air Pump. Edward H. Weatherhead, Cleveland, O. The main casing is provided with ports and passages, and carries the main valve and piston, with a fixed stop to limit the movement of the valve tube.
- 526,788. Machine for Pulverizing Rock. Peter McKellar, Fort William, Can. Impact rolls, carried in a yoke, or frame, and revolving in a mortar.
- 526,808. Furnace for Distilling Zinc. Carl Francis, Schweidnitz, Ger. Combination of a series of retorts, communicating with two chambers and a series of condensers.
- 526,874. Apparatus for Casting Metals under Pneumatic Pressure. John J. C. Smith, Passaic, N. J., and Eugene C. Smith, Providence, R. I. This is a metal box, with hinged top and sides and suitable packing, in which the mold is made, and which can be closed tightly.
- 526,910. Manufacture of Cement. Brierley K. Rigby, Ditton, Assignor of one-half to Francis Augustus Remington Neil, St. Helens, and Austin Cooper Carr, Rainhill, England. The method consists in adding clay to lime-mud residue from the Le Blanc process, then calcining and grinding in the usual way.
- 526,913. Pumping Engine. George B. Whiting, Wilmington, Del., and Frederick M. Wheeler, Montclair, N. J., Assignors to the George F. Blake Manufacturing Company, of New Jersey. Combination of vertical pump cylinders, direct-acting steam cylinders and a walking beam to equalize the motion.
- 526,914. Cupola Furnace. John H. Whiting, Detroit, Mich. Combination of a permanent outer shell with tuyere openings, an adjustable sliding plate and a tuyere arranged in line with the opening in the plate.
- 527,012. Hydrocarbon Burner. Harvey Cluff, Grand Rapids, Mich. Combination of supply pipe, inverted cone and discharge jet, with means for regulating the draft.

## PERSONAL.

Mr. Marcus Daly, of Montana, has been visiting Spokane and other places in Washington.

Mr. G. F. Yost has accepted a position as draughtsman with the Lehigh Valley Coal Company.

Mr. Walton Renton Ingalls, mining engineer, of New York, has gone to Colorado on professional business.

Mr. Henry M. Howe, of Boston, the well-known authority on the metallurgy of steel, returned last week from his visit to Europe.

Mr. F. L. Garlinghouse, who for a number of years was chief engineer of the Pittsburg Bridge Company, has accepted the position of chief engineer of the structural department of Jones & Laughlins in Pittsburg.

Governor Hughes, of Arizona, has added to the duties of Prof. Edward M. Boggs, in charge of the department of civil and hydraulic engineering of the university of Arizona, by appointing him territorial irrigation engineer.

The Baron de Batz, who was for four years mining engineer to the Lexington Mining Company at Butte, Mont., and as an assistant commissioner was sent by the French Government to the World's Fair, has resigned his position with the Direction of the Lyons Exposition and intends to devote himself to professional business in Paris, 26 Rue d'Orfmont. Baron de Batz, having acquired a very extensive knowledge of American mines and mining, and of the advantages which this country offers to the investment of the abundant French capital which seeks investment all over the world, will be in a position to do excellent service both to his compatriots and to the mining industry of the United States.

Mr. T. A. Rickard, mining engineer, superintendent of the Enterprise Mine at Rico, Colo., and of the Yankee Girl Mine at Red Mountain, Colo., has just made an extremely interesting trip of 454 miles on-horseback through the mining districts of Colorado. Starting from Rico on September 29th he went by Ophir, Red Mountain, Animas Forks, Mineral Point, Lake City, Creede, Del Norte, Mosea, Sierra Blanca, Mosea Pass, Silver Cliff, Canyon City, Cripple Creek, Colorado Springs, Manitou and Denver. The trip was accomplished in 10 days, with a day spent at Creede and one at Cripple Creek. Mr. Rickard is becoming one of the best informed engineers in the country on the geology and mineral resources of the Rocky Mountains, and in this last trip has added much to his store of useful knowledge in this field.

## OBITUARY.

H. F. Ross, who died in Virginia City, Nev. October 1st, was an old-timer on the Comstock. He was for a number of years in charge of the pumps at the Crown Point mine, and had been employed at other mines. He was 53 years old.

Charles C. Parsons died in Spokane, Wash., October 5th, of typhoid fever. He was in that city on professional business. He was a resident of Boston, and was for some time consulting engineer of the Boston & Montana Mining Company.

The body of James H. Crossman, a well-known mining man and speculator, was found in his room at the Baldwin Hotel, San Francisco, October 5th, and on a table by his side was a bottle of deadly compound of ammonia and a glass half full of the same drug. Several letters addressed to his wife were found. Poor success in land speculation is supposed to be the cause of the deed. Crossman was at one time owner of some valuable property. He was the owner and manager of the Temescal tin mines in Southern California.

## SOCIETIES AND TECHNICAL SCHOOLS.

Technical Society of the Pacific Coast.—At the regular meeting in San Francisco, October 5th, Mr. A. M. Hunt read a paper on "California Crude Oil and Its Use as Fuel." Mr. W. G. Curtis then read a written discussion on the striking paper by Mr. Dunn on "Transportation and Its Relation to Production in California," which was read at the September meeting of the society.

Western Foundrymen's Association.—At the September meeting, in Chicago, September 26th, the members of the association spent the afternoon in visiting the South Chicago works of the Illinois Steel Company. At the meeting in the evening Mr. Potter read a paper on the "Blast Furnace," which was discussed at some length by Messrs. E. A. Wheeler, R. W. Hunt, G. W. Cope and others.

Civil Engineers' Society of St. Paul.—At the regular meeting, held October 1st, a circular communication from Mr. E. L. Corthell, dated July 7th, 1894, proposing an international association of engineers and architects was referred to Mr. Estabrook and Mr. Hilgard as a committee of consideration. A letter from Mr. O. Chanute, transmitting a medal, a lithograph and two reports of the French Society of Civil Engineers in commemoration of trip to America in 1893, was placed on file and

accompanying souvenirs accepted. Mr. Oliver Crosby was elected a member. Printed copies of Mr. Woodman's paper on "Transition Curves" having been distributed among the members a week or two before, the author opened the discussion by briefly stating his reasons for preparing the paper, and afterward reviewed the somewhat complex work of Mr. C. L. Crandall. Other members spoke of personal experience with the easement curve and several letters on the subject were read. It was decided that the discussion should be continued at the November meeting, that the various recitals should be put in writing, and that the resulting matter should be arranged for publication by Mr. Woodman and the secretary.

Engineers' Club of St. Louis.—At the regular meeting, October 3d, Charles O. Fisher was elected a member. Mr. E. A. Hermann was chosen librarian of the club. Resolutions were adopted acknowledging the receipt of courtesies from the French Society of Civil Engineers. Mr. N. W. Eays then gave an informal talk on the power-house of the new Union Station in St. Louis. The steam plant consists of four 250 H. P. Babcock & Wilcox boilers, set with revolving chain grates. The steam is used to operate three Buckeye tandem compound engines and two air compressors. The engines are directly connected to Siemens-Halske generators, which operate at 500 volts, and whose output is distributed by the five-wire system, permitting the operation of both arc and incandescent lamps. The compressors furnish air for the interlocking plant, which is the largest in the country, and with which 240 train movements were recently made in a single hour. The station is heated from this plant, the pipes being laid in a conduit about 1,800 ft. long. The indirect system is used in the main building. Air is taken in at the top of the tower by two fans in the sub-cellar and passed over steam coils. Each fan is driven by a 40-H. P. motor. Direct radiation is used in the offices. Discussion followed by Messrs. Tausig, Bryan and Kinealy. Mr. J. A. Laird then presented the results of some experiments recently conducted by the water department to determine the efficiency of various forms of steam pipe covering. The results showed the relative condensation in a 1-in. pipe as follows, with different kinds of covering: Magnesia plastic, 331; asbestos fire felt, 367; plaster paris and sawdust, 438; asbestos sponge cement, 604; bare pipe, 1,085. The initial steam pressure was 30 lbs. Prof. Kinealy called attention to the fact that these experiments agreed well with previous investigations, which had shown that the best coverings reduced the condensation to about one-third that in the bare pipe.

## INDUSTRIAL NOTES.

Salt Lake papers report that negotiations are in progress for the establishment of steel works in that city by Chicago parties.

The American Iron and Bolt Company has been organized at Cincinnati, O., to succeed the L. M. Dayton Bolt, Nut and Hinge Works.

The Fayette Manufacturing Company is furnishing the Spang Steel and Iron Company, of Etna, with magnesia fire-brick for the new basic open-hearth furnace.

The Lake Shore Iron and Steel Company, of Chicago, has been incorporated by Hugh J. O'Neil, Henry J. Benjamin, and Samuel F. Knox, with a capital stock of \$20,000.

The Midland Steel Company, Muncie, Ind., has begun the erection of another open-hearth furnace, rendered necessary by the increasing business of the finishing department.

Mr. Arthur Holland has retired from the firm of Naylor & Co., and has opened up an office in the German National Bank building, Pittsburg, under the name of Holland & Co.

The Shickle, Harrison & Howard Iron Company's open-hearth steel castings foundry, St. Louis, is engaged on a great variety of railroad, engine, electrical, excavating machinery and miscellaneous work, and is turning out a fine low carbon product.

An overhead traveling crane of 40,000 lbs. lifting capacity is to be added to the shop equipment of the Fulton Foundry, in St. Louis. This crane is to be operated by electricity, and is now being built by the Morgan Engineering Company, of Alliance, O.

The Hall Steam Pump Company, Allegheny, Pa., is furnishing a compound vertical steam pump to the Bellaire (O.) Nail Works, while the contract has been secured from the Manufacturers' Natural Gas Company, of Canonsburg, Pa., to furnish part of a gas pump.

The court has ordered a special hearing at the Master's office in Philadelphia, on the proposed order of sale of the property of the Pennsylvania Steel Company. The hearing will be on October 19th. The company's works at Steelton are now very busily employed.

The Totten & Hogg Iron and Steel Foundry Company, Pittsburg, manufacturers of rolling mill and tin-plate machinery, and rolling mill engines, have just received an order from the American Tin Plate Company, of Elwood, Ind., for a train of 20-in. cold rolls, complete with rolls.

The Jeffrey Manufacturing Company, Columbus, O., has published a handsome photogravure, showing the various styles of coal-mining machines manufactured by it, operated by electricity or compressed air. The latest machine is a new chain under-cutter operated by electricity.

H. E. Collins & Co., Pittsburg, have received a contract for the iron building to be erected by the Keystone Rolling Mill Company, which will be 60 x 200 ft.; also to erect for the Philadelphia Company, at Murraysville, Pa., two buildings, one to be 42 x 60 ft., and the other 42 x 35 ft., constructed of iron and steel.

The Union Chain Works, Allegheny, Pa., has again been put in operation, after an idleness of three years. The firm has been reorganized and the works are now controlled by Messrs. Riter, Hacke & Prugh. New machinery has been put in, together with a number of welding furnaces. The machine shop is 50 x 90 ft., and the molding shop 30 x 80 ft.

The Pittsburg Bridge Company has received from James Stewart & Co., of St. Louis, who have the contract to erect the new passenger station at Syracuse, N. Y., an order for the steel roof trusses to be used in the same. The company is engaged in building a steel head frame for a shaft hoist for the Sterling Iron and Zinc Company, at Franklin Furnace, N. J.

The Pittsburg Department of Public Works has awarded a contract to the Edward P. Allis Company, of Milwaukee, for the construction of two pumps at the Brilliant pumping station, at a cost of \$169,000 for the pair. The pumps are to have a capacity of 12,000,000 gals. each every 24 hours, and they are to be completed in 7 and 10 months respectively from the letting of the contract.

Fraser & Chalmers, Chicago, have secured the contract for the big steam plant of the West Side City Railway Company, St. Louis. The steam equipment will include three 2,000 and one 1,000 H. P. horizontal compound, non-condensing Corliss engines, twenty 400 h. p. boilers, and all the feed water heaters, pumps, piping, connections, etc. The boilers are furnished by the Stirling Company, of Chicago.

The Battle Creek Machinery Company was incorporated in 1873 for the purpose of manufacturing wood-working machinery, doing also a general foundry and machine shop work. In 1888 the company commenced the manufacture of the Marsh steam pump. During the past six years the pump business has assumed such proportions that the stockholders have considered it wise to change the name of the company from the Battle Creek Machinery Company to the Battle Creek Steam Pump Company. The articles of incorporation have been amended accordingly. It is the purpose to continue to manufacture the Marsh steam pump, Boul's wood-working machinery and solid steel cutters.

In the Common Pleas Court in Pittsburg, October 5th, statements were filed in suits brought by Waring Brothers against the Pennsylvania Railroad for amounts aggregating \$2,300,000. The suits were brought in 1879 and 1880, and have not been pushed since that time. The first suit is for \$800,000. The plaintiffs state that they were engaged in the business of shippers of oil and that during the period between November 30th, 1873, and March 1st, 1875, they delivered to the railroad company for transportation from Oil City and other points to Philadelphia 477,774 barrels of oil. The defendants are charged with making excessive charges for freight, and they promised a rebate of a sum amounting to \$679,299. The second suit is for \$1,500,000. The plaintiffs state that they invested in their plant \$1,200,000, and that the defendants, together with the Allegheny Valley Railroad Company, the Standard Oil Company, the Atlantic Refining Company, the Atlantic Storage Company, Warden, Frew & Co. and Lockhart & Frew, conspired to prevent the plaintiffs from shipping their petroleum over the railroads for equitable and ordinary rates.

As a result of the visit of Chief Engineer Connett and President Phillipps, of the Metropolitan Railroad Company, of Washington, D. C., to New York, Schenectady and Chicago, and after having investigated several underground electric systems, the company has decided to adopt for the Ninth street line the electric system patented by the General Electric Company. Mr. Phillipps states that the General Electric system is practically the Buda-Pesth system, with such improvements as time and experience have shown it to be necessary to make. The weak points have been strengthened and the system has been made one in which the liabilities to derangement are reduced to a minimum, and upon which repairs may be made in the shortest possible time and at the least expense. The work will commence as soon as the plans are completed. The conduit is to be so constructed as to permit the use of a cable in case the proper insulation of underground wires, such as are used in the improved Buda-Pesth system, prove impossible during the winter months. The conduit will be built in accordance with the latest engineering ideas. The General Electric Company, which controls the Buda Pesh patents in this country, will construct the line. A meeting of the stockholders was held October 3d for the purpose of discussing the methods to be adopted in order to raise the necessary money.

## 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.

## Cherokee County.

(From our Traveling Correspondent.)

The discovery of the bed of bituminous clay at the Washer bauxite banks at Dykes has been followed by a similar discovery in sinking a shaft at the War Whoop bauxite bank, in the same district, about two miles to the northeast. At this latter place of discovery the clay was encountered in running a tunnel from the bottom of a 60-ft. shaft, where it resisted all efforts to continue the work because of its moist mud-like character, which caused it to cave and destroy the timbers, by the aid of which the miners were attempting to continue tunneling. Imbedded in this clay were found quite large lumps of a harder substance, having every appearance of charcoal, with the grain of the wood easily discernible by the aid of an ordinary lens. After this clay and charred wood (as I will term it until analysis has determined its proper classification) have been dried by exposure to the air, both burn readily, and the management of the property is considering the practicability of using this product for fuel in a drying furnace, which is being erected on the property for treatment of bauxite ore previous to shipment. During a recent visit by Dr. Eugene A. Smith, State Geologist for Alabama, he carried away a considerable amount of this bituminous clay for the purpose of determining by analysis its proper classification. From all indications it would appear as though an immense bed of the material occurs in association with the Alabama bauxite ores. Dr. Safford, of Tennessee, is also working on a determination of its classification; and several samples were sent east by Mr. Garvin, superintendent of the Bass Furnace Company, on whose property it was first discovered, which analyzed as high as 90% combustible matter, with the ash containing 5% alumina and 3% silica.

## ARIZONA.

The report of Gov. C. L. Hughes, of this Territory, to the Interior Department, for the year ending June 30th last, refers to the closing of silver mines, caused by the low price of silver, which resulted in a large increase in prospecting for gold, and also in the working of gold properties. The gold output for the year was \$2,080,250; silver, \$1,700,800; while the copper produced from the Arizona mines was 48,279,500 lbs. The increase in the gold output over the previous year was \$1,078,000, and from the present monthly output the governor estimates that the gold production of the Territory for the calendar year 1894 will be at least \$4,000,000, with a prospect of almost or quite doubling that amount in 1895.

## Cochise County.

Copper Queen Mining Company.—This company at Bisbee is putting up new converters for treating the matte from the furnace. They are nearly ready for use. The company is now working about 400 men.

## Gila County.

Humphrey Mine.—A lot of 50 tons of ore is being packed from this mine, near Lost Gulch, to the Klein mill. Should the results be favorable, work on the mine will be pushed.

## Mohave County.

Samoan Mining Company.—This company has been incorporated by C. S. Thomas, G. H. Waterbury and others, to operate mines in this county. The principal office is in Denver, Colo.

## Pinal County.

Mammoth Mining Company.—This company continues working steadily and the 50-stamp mill is kept constantly running. New hoisting apparatus is being put up at the Mohawk mine, and will soon be ready to operate.

## Yavapai County.

Edmund Mine.—Two parties are claiming and attempting to work this mill, near Skull Valley, and trouble is expected between them.

## Yuma County.

Harqua Hala Gold Mining Company.—The manager's report for the month of August gives the following particulars concerning the milling department: The batteries were in service 30 days, and the milling operations for the month were: Ore crushed, 3,320 tons; amalgam cleaned up, retorted and melted into bullion is estimated to yield on assay \$24,575, which, added to the estimated profit from general store, \$500, gives a total of \$25,075; expenses on revenue account (estimated), \$11,500, leaving an estimated profit for the month of \$13,575; average loss in tailings, 2.20. The fineness of the bullion is about the same as last month, 785 in gold

and 175 in silver, total 960. All departments are in good working order.

## CALIFORNIA.

## Calaveras County.

Parnell Mining Company.—This company has been organized to operate mines near Angels. The principal office is at Angels, and there is an office also at San Francisco. W. G. Arnold, R. S. Montenegro, R. W. Koch are directors.

Sinderaxa Mining Company.—This company has been organized with \$500,000 capital stock to operate mines in this county. The office is at Mokelumne Hill. N. S. Wright, T. E. Pope, J. R. Little and W. M. Daring are directors.

## Kern County.

Bonanza Mine.—This mine, in the Red Rock district, is being actively worked by the owners, R. C. Hall and others. The great drawback during the present season has been the lack of water, and the company is now engaged in building water-works. They have sunk a well to bed-rock, and have ordered a large pump of 45-H. P. boiler, and 2 miles of 5-in. pipe, by which the water is to be pumped to the reservoir above the mine.

Success Mine.—On this property, which adjoins the Bonanza, work has also been successful, and the owners are now engaged in searching for a supply of water.

## Placer County.

English Mountain Mine.—This old mine, at Emigrant Gap, which has not been worked for some years, is to be started up again, the present owners believing that the low-grade ore can be worked at a profit. New mill machinery is to be erected, and a contract has been made with the Vulcan Iron Works, of San Francisco, to put up a wire-rope tramway 3,000 ft. long to carry ore to the mill.

## COLORADO.

The receipts of the Denver mint for the month of September were \$631,746, against \$215,488 for September of last year. The receipts for the three quarters of 1894 have been as follows: First quarter, \$730,926; second quarter, \$1,303,217; third quarter, \$1,983,224; total for the nine months, \$4,017,367, an increase of \$2,787,950 over the corresponding period last year.

## El Paso County.

Caribou Gold Mining Company.—This company has been incorporated by J. B. Wheeler, H. S. Cable and others, with \$600,000 capital stock, to work mines in this county. The principal office is at Monticou.

Plathora Gold Mining Company.—This company has been organized by James C. Ewing and others to operate mines in this county.

Stanley City Mining and Milling Company.—This company has been incorporated by Thomas Stanley, A. B. Boylan and others, with to mines and mill ores in this county. The principal office is at Monument.

## Gilpin County.

(From our Special Correspondent.)

Concentration works are being put up on Clear Creek, a short distance below Black Hawk. The point chosen is below the stamp mills on the creek, and the intention is to work in the new mill the tailings from the mills above, which still contain a small amount of gold. The company intends to concentrate these tailings passing through its plant the water from the creek, which carries a large amount of the tailings in suspension. The works will use the Card reserve current process, and they will have a capacity of 50 tons per day. They will be so arranged that additions can be made should the results prove successful.

## Gunnison County.

Corydon Mining Company.—This company has been organized by Howard Evans, A. T. Moore and others to operate mines in this county. The capital stock is \$400,000.

## Lake County.

Golden Eagle Mining Company.—At the annual meeting in Leadville last week the following directors were chosen, George W. Skinner, J. H. Weddle, Peter W. Breene, R. J. Allison, J. C. Stillwell, A. S. Weston and George O. Keeler. The board elected George O. Keeler, president; J. H. Weddle, vice-president; Peter W. Breene, treasurer; R. J. Allison, secretary.

(From our Special Correspondent.)

Bohn Shaft.—This new shaft is down 170 ft., and has already encountered the water, which is proving of considerable trouble, but will not interfere with the sinking operations.

Free Coinage Group.—A lease for six years was given this week by L. D. Rudbush and others to J. C. Boyd on the Free Coinage, Hidden Treasure, Mountain Queen Superior, Silver Plum, Starry Banner, World's Fair, Homestake, Monmouth, Katie McGoff and Golden Treasure lodes. These properties are all located in the California mining district.

Gray Eagle Consolidated.—About 140 tons of carbonate and iron are being shipped daily, 115 men are at work in the consolidation, including the Grey Eagle, Pocahontas, Orion and Penrose. All shipments are from the latter shaft. The water flow has decreased to 1,000 galls. per minute.

Lucky Joe.—This property, in Twin Lakes district, is to be vigorously developed by the owner, Mr. J. W. Dixon, of Philadelphia. A 30-stamp mill is being

erected on the ground, and 24 tons will be treated daily.

Northern Mining Company.—This company has leased a piece of ground from the Clipper, and the shaft already down 485 ft. is to be sunk 150 ft. further. They expect to find the rich lead ore chute of the Walcott.

Rock Hill.—The largest shipper on Rock Hill is the least on the Stone. A good body of carbonate ore was recently encountered, and 36 tons a day are being shipped.

Welden.—The new shaft is down 430 ft. in porphyry, which is stained. The shaft was started July 15th, and has been sent down faster than any shaft ever sunk in the camp. The first water met with was encountered this week, and this is only a very small flow.

Yak Mining Company.—In the workings the big Silver Card tunnel is being pushed ahead. Two drills are also in use. At the mill 40 tons of ore is being reduced daily.

## La Plata County.

Little May Mining Company.—This company has been incorporated by M. R. Shields, A. A. Stewart and others, with \$100,000 capital stock, to operate mines in this county.

## Routt County.

Willow Canyon Mining Company.—This company has been incorporated with \$500,000 capital stock to operate mines in the neighborhood of Hahn's Peak. The principal office is in Des Moines, Ia., where most of the stockholders reside.

## IDAHO.

## Shoshone County.

Morning Mining Company.—An interesting experiment has been undertaken by Mr. D. B. Huntley, manager of this company's property. He has leased the property and has made public announcement that beginning with October 8th, if a sufficient number of men are satisfied with the conditions, operations at the mine will be resumed. The conditions are announced by Mr. Huntley as follows in a public advertisement:

I propose to work the Morning mine on the co-operative plan. By the terms of the lease 25% of the net proceeds of the ore or concentrates produced goes as a royalty to the Morning Mining & Milling Company, which will pay all taxes, insurance, legal expense, Milwaukee office expense, assessment work, and all special improvements, new buildings and mine development work. The remaining 75% of the proceeds of ore or concentrates will be used as follows: 1. To pay to the company \$1,360 monthly toward expense of mine development. But the ore mined by the company in doing development work will not be kept separate, but go with the other without extra charge. 2. To pay operating expenses of mill, railroad, office and general repairs to mill and railroad machinery. 3. The remainder shall be divided among the lessee and the entire underground surface and tramway mine force in proportion to the number of days each has worked, and according to the class of labor to which each belongs. This division shall be so made that carmen, shovelers and general surface laborers shall receive five-sixths as much per shift as a miner. Blacksmiths, carpenters and head timbermen shall receive one and one-sixth as much as miners per shift. Shift bosses shall receive one and one-half as much as miners. The foreman shall receive twice as much as miners. The manager and lessee shall receive three and one-half times as much as miners per shift. The mine will not be gouged, but timbered, stoped and worked in the ordinary manner by a foreman and shift bosses, and men hired and discharged as ordinarily. In case of quitting work or discharge, such person will be paid three-fourths of the amount estimated by lessee to be due him and given a salable time check for the balance. The amount of this check will be paid or sent him when the month's accounts are settled. Settlements will be made monthly. At mine boarding-house board will be \$6 per week, and 90c. per day for fractions of a week, and board will be deducted at the office. Men can board and trade where they please. To prevent disputes and give confidence that men get what they earn, the entire mine force may elect each month from among their number a committee of three, who may visit the office, inspect the accounts and investigate fully the receipts, expenses and proportional payments to each man. In such election a person working less than half a month shall have but half a vote, and not be eligible as a member of the committee. By the terms of the lease all company tools and all broken packages of sundry supplies now on hand can be used without charge, but all new unplaced machinery, all original packages of supplies, and the mining timber and fuel on hand are to be paid for at cost as used each month. By the terms of the lease, also, each workman entering the employ of the lessee will be required to sign an agreement releasing the Morning Mining and Milling Company from all claims for damages from injuries or wages due from lessee. For self protection also the lessee will require each workman before going to work to sign an agreement releasing the lessee from claims for damages from injuries received while working at the said company's property; and also an agreement to accept as full pay his proportional share, as before explained, of the month's receipts. If found practicable soon after starting, most Sunday work will be discontinued.

Mr. Huntley agrees that these conditions will not be changed during the next four months, and further warns miners not to come unless they are fully prepared to accept the conditions. It is believed that under present conditions by this plan outside men can make \$2.50 and miners \$3 per day. The result of the experiment will be waited with interest. The miners have heretofore insisted upon \$3.50 per day in this region.

## MAINE.

## Hancock County.

Chase Granite Company.—This company is making arrangements to open up its quarry at Blue Hill this fall. The property will have machinery of the best character. The officers are: H. B. Slaven, of New York, president; E. E. Chase, secretary; G. H. Stover, treasurer.

## Knox County.

Shepherd Lime Company.—This company's quarry, in the town of Rockport, is the largest and probably the oldest in the United States now in operation, since work has been carried on in the quarry continuously from 1815 up to the present time.

## MICHIGAN.

## Copper.

Atlantic Mining Company.—The following interesting notes are given by a correspondent of the Boston "Transcript": Ten years ago the shores of Portage Lake were lined with stamp mills; now all are silenced save one, the Atlantic, two miles west of Houghton, and that is soon to go. The Federal government objected to the mills. The sand from the 5,000 tons of rock stamped every 24 hours by the big mills was fed into the lake, and the channel in time was impeded, so that government dredges had to be set at work deepening and straightening the passage for vessels. As the government has expended a great deal of money in purchasing the ship canal which connects the narrow arm of Portage Lake with Lake Superior in order to make this lake a harbor of refuge, no such damage to this channel would be tolerated. The Quincy and other mills on the north shore of Portage Lake have been torn down and rebuilt, or replaced with larger and more modern structures on the west shore of Torch Lake, seven or eight miles farther north, the change of base necessitating the construction of railroads from the mines to the mills. The Atlantic, situated on the south shore of the lake, has lingered longest, for the conditions of removal were hardest with that company; but the time came when it was necessary to move, or stop the mine, because the mill could not run, and plans were made which are now carrying into execution, at an outlay of \$300,000. In order to find a suitable mill site it was necessary to leave Portage Lake, and a location was chosen at the mouth of the Salmon Trout River, on Lake Superior, nine miles overland from the mine, which is two miles south of the old mill. A standard gauge railroad track has been built between the mine and the new mill site, and the largest locomotive in the State was placed in commission last week. This and the other locomotives on the Atlantic & Lake Superior Railway, as the line belonging to the company is called, will haul rock from the mine to the mill, and at present is used in transporting supplies, building material and machinery to the new mill, which is well under way and will be completed and in running order in four months. The mill is 130 by 231 ft. on the ground, standing 30 ft. above the lake. It will have six Ball heads, or steam stamps; these and the necessary jigs, Evans tables and vanners being driven by an engine for which eight boilers of 140 H. P. each will furnish steam. The rock crushed by each head of stamps will require 1,000 gallons of water per minute, to supply which a 53 ft. dam has been built across the mouth of the Salmon Trout River, backing the water up for a distance of a mile and a half. The minimum overflow from this dam when once filled is 11,000 gallons per minute, or almost twice the estimated amount required for the new mill, and the maximum is 130,000 gallons—enough to supply all the mills of Houghton County.

Calumet & Hecla Mining Company.—This company has just completed the laying of a new steam pipe line from the Superior boiler-house to the electrical building. The new line is a 12 in. steel pipe, and will replace the 8-in. pipe, which has been found insufficient to supply the engine. The company has purchased 10 small locomotives, with cylinders 5 x 6 in., and adapted to use compressed air, which will be put to work underground where most tramping is done. The use of these engines will greatly lessen the labor now performed by the trammers, and, it is also expected, will be economical.

Kearsarge Mining Company.—The new course of copper ground discovered in the north end of this mine is reported to be holding out well, and the deposit is improving a little in quality as the drift extends northward. So far, however, the developments, although good, can hardly be called of very great importance.

Tamarack Mining Company.—The small strike mentioned last week was speedily settled, the men returning to work the following day on a promise from the superintendent that their complaints against the obnoxious foreman should be investigated.

## Iron—Menominee Range.

Commonwealth Iron Company.—This company has somewhat increased the force employed at its

Badger mine. A little over 30,000 tons were taken out in September.

Crystal Falls Mine.—The report that operations had been resumed at this mine does not seem to be supported by the facts. Nothing new is being done at the mine, says the "Diamond Drill."

Pewabic Iron Company.—This company mined about 40,000 tons of ore in September, making the total amount for the season, up to October 1st, 265,000 tons. The company expects to ship 60,000 tons more this season, unless navigation closes much earlier than usual. About 700 men are at work in and about the mine. Last week the company commenced using electric lights. The system was put in under contract by the Iron Mountain Electric Lighting Company. There are 130 lights used underground and about the same number on the surface, and the contract calls for a capacity of 350 lights altogether.

## MINNESOTA.

## Duluth.

(From our Special Correspondent.)

Iron ore shipments to October 1st were as follows in gross tons and round figures: Mesabi range, Mountain Iron, 430,000 tons; Oliver, 415,000; Franklin, 90,000; Biwabik, 55,000; total over Duluth, Missabi & Northern road, 990,000 tons. Other mines about 340,000 tons. Total Mesabi range 1,330,000 tons. Vermilion range, Minnesota Iron Company, 820,000. Total 2,150,000 tons.

Two cargoes of crude barytes, 500 tons each, were lost on Lake Superior last week, one being sunk and the other washed ashore. They were from McKellar's Island, for the Duluth Barytes Company. The wrecked barges were valued at \$6,500.

## Iron—Mesabi Range.

(From our Special Correspondent.)

Minnewas.—This mine will ship one cargo in a week or two. It will do no mining this year.

Mountain Iron.—This mine has not been shipping the past week, tracks being changed in the ore bed. The Rathbun cut is being put through the Mountain Iron body, a distance of 1,200 ft., at a deeper level than before, thus giving the steam shovels a chance to work east and west in what now is the largest uncovered body of ore in the world. There will be opportunity to load as high as 400 cars, or 9,000 tons, every 24 hours. Three steam shovels are at work in the cut. All the workings of both Mountain Iron and Rathbun have been strung for electric lights the past week; 50 double carbon arcs are to be used.

Ohio.—This mine will ship a few cargoes this fall if possible. Tod, Stambaugh & Company, are agents.

Oliver.—This company shipped in two days last week 22,000 tons, which is about the amount which will be sent out weekly for the rest of the season.

Rouchleau-Ray.—At one mine of this company, section 17-52-17, diamond drilling is being done to find the thickness of the ore body. This is one of the big properties of the range.

## St. Louis County.

Bevier Gold Mining Company.—This company has temporarily suspended work at its Little America mine in the Rainy Lake District, on account of the large quantity of water coming in. New pumps, a hoisting engine and other machinery are to be put in before work is resumed.

(From our Special Correspondent.)

A lease has been closed by the owners of the Little American gold mine at Rainy Lake, under which G. A. St. Clair, late of the Ishpeming region, takes the mine for a term of years. One consideration of the lease is the payment of \$4,800 the first year, and more thereafter, besides a royalty, and the sinking of the present shaft 110 ft. to a depth of 150 ft. St. Clair is to organize a mining company and expects to sink two additional shafts adrift from them to the present shaft, which is in the center of the island. The cost of shaft work is estimated at \$30 per foot for the entire depth. It is learned from reliable sources that the value of all rock treated so far at the mill has been about \$9 to the ton, and not \$17 as has been claimed. The tailings which have been claimed to be of a value of \$200 to \$300 to the ton, are actually of very little value, so free is the quartz. The Little American people expect to close two or three more leases in a few days.

The Ward brothers, who have a gold property on Rainy Lake, are buying machinery for development.

## MISSOURI.

## Jasper County.

(From our Special Correspondent.)

JOPLIN, Oct. 8.

There was a general activity among the mines during the past week throughout the entire district. There was no advance in the price of zinc ore over the previous week, but prices were firm and a demand for all that was offered on the market. Prices ranged from \$18 to \$20.50 per ton, \$20.50 only being paid the latter part of the week for a few extra lots of high grade clean ore. The general outlook for a heavy production from now on to the close of the year is certainly good, and the operators are of the opinion that present prices will be maintained. Lead ore was in rather an unsettled condition during the week, and producers were not anxious to sell at present prices of \$16.25 to \$16.50 per thousand, but at the present quotations of pig lead in St. Louis, that of \$2.90 to \$2.95 per 100 lbs., the smelters are paying the top price, and in some instances they are paying more than the ore is

worth if it was sold on its actual assay value of metal contained.

Following are the sales of ore from the different camps: Joplin, 1,332,810 lbs. of zinc ore and 435,870 lead, value \$20,240; Webb City, 504,880 lbs. of zinc ore and 58,610 lead, value \$5,529; Carterville, 1,637,970 lbs. of zinc ore and 162,760 lead, value \$18,031; Orozoco, 39,150 lbs. of zinc ore and 53,900 lead, value \$1,611; Zincite, 73,820 lbs. of zinc ore and 10,720 lead, value \$849; Galena (Kan.), 1,165,080 lbs. of zinc ore and 265,210 lead, value \$13,985; Spring City, \$63,960 lbs. of zinc ore and 15,090 lead, value \$720; district's total value, \$60,963; Granby, 374,470 lbs. of zinc ore and 74,170 lead, value \$4,680; Aurora Lawrence Company, 1,092,160 lbs. of zinc ore and 127,650 lead, value \$10,453; Springfield Green Company, 41,790 lbs. of zinc ore, value \$437; Brookline, 43,260 lbs. of zinc ore, value \$230. Lead and zinc belts, total value \$76,765.

Margarum Mining Company.—John Schellenbach's Sons have just completed and put in place one of their latest improved 12-in. double-acting Cornish pump plants on this property, north of Webb City. This is the second large pump plant that the firm has put on this property during the past year.

Picher Lead Company.—During the past week this company closed down the slag eye furnaces, and is making general repairs to the plant. The works will start up with full force this present week.

## Newton County.

(From our Special Correspondent.)

Wentworth District.—Late reports from this new district are very encouraging, the new concentrating mill at the Gobbler mine is nearing completion. New development in the Gobbler mine has recently opened up a deposit of lead; this is something new as heretofore not a particle of lead had been found with the zinc ore.

## MONTANA.

## Beaverhead County.

Hecla Consolidated Mining Company.—This company has declared and will pay, on October 25th, dividend No. 130, of 1% on its stock, requiring \$15,000 for its payment, and making the total amount up to that date \$1,950,000.

## Choteau County.

A party of prospectors, consisting of Charles M. Blackman, Robert Caldwell and others, report the discovery of a copper lead in the North Fork country. The outcroppings were traced for two miles, and a number of samples of the ore were brought in.

## Deer Lodge County.

(From our Special Correspondent.)

Ontario Mine.—The concentrator, the present capacity of which is 75 tons ore, 15 tons concentrates per day, is shipping about five carloads weekly to the Helena Smelter; the value per car runs from \$500 to \$800. They are working at present the low-grade ore, of which they have on dump and in sight 12,000 to 15,000 tons. They are sinking 300 ft. below tunnel level and have put in an underground hoist of good capacity. They expect to double the capacity of the concentrator when the work is finished, which will put in sight a large amount of high grade ore, such as was formerly shipped before the reorganization of the company, and give them a shipping capacity of 30 tons per day.

A novel syndicate has been formed among some of the employees of the Montana Mining Company. They have formed a pool, paying in a stipulated sum each month, and have sent a number of experienced mining men into the hills prospecting and locating leads. Whatever discoveries are made belong share and share to the syndicate. The party have now been out for a number of weeks, and it is understood that they have struck some very good leads in the vicinity of Granite Butte and in the Poorman district.

## Jefferson County.

Butler.—This mine, the west side of the mountains from Whitehall, has been bonded to the Anaconda Company, says the Butte "Inter Mountain," and a large hoist will be placed on the property at once for the purpose of thoroughly developing it.

Golden Sunlight.—The framework of the 150-ton concentrator is up and ready to be housed in. The boiler and engine are on the ground and everything is ready for the placing of the machinery in position. About 80 men are employed at both ends of the tunnel. The air is said to be bad and slow progress is being made, but when the tunnel is connected there will be no trouble on this account. A tramway will be erected to transport the ore from the mine to the smelter.

Liverpool and Washington.—These claims situated on the west side of Prickly Pear, two miles north of Clancy, or about 13 miles southeast of Helena, and nearly opposite the old Legal Tender mine. The leads are only about 1 ft. wide on top, but increase to 2 ft. at a depth of 300 ft. The ores are refractory, containing zinc and silver, but the zinc runs into lead as depth is attained. The lead is nearly run perpendicular, and runs across the granite formation. The steam hoists are on the claims, which are down 200 and 300 ft. respectively. The ores from these mines are shipped to the East Helena smelter. Two lines of railroads pass by the mouth of the gulch, where a town site is said to have been surveyed.

## Lewis &amp; Clarke County.

**Bald Butte Mining Company.**—This company has declared dividend No. 30, of 5% on its stock, amounting to \$12,500, which was paid at the office in Helena, October 3d. This makes the total amount paid up to date \$295,000.

**Bald Butte Mining Company.**—Chas. Sincos and James Ellison have a contract for running a tunnel 2,000 ft. on the newly-discovered Bald Butte lead. The tunnel starts from near Edge's 5-stamp mill and runs under the old workings in the Bald Butte mine. This is one of the largest contracts ever let in that section. It is supposed that the tunnel will expose a large amount of ore.

**Belmont.**—All efforts on the part of the Helena stockholders to start up this mine and mill have been unavailing, says the Marysville "Mountaineer." Washington Becker, of Milwaukee, who owns a controlling interest in the property, will not permit resumption of work on this old and reliable property.

**Mammoth Mine.**—This mine, on Eagle Creek, in the Park district, has been sold by J. A. Wood to A. L. Lamers and others for \$12,000. Capitalists of Duluth are also in the deal. A mill and concentrator will be erected at once, and work will be pushed under the supervision of A. L. Lamers.

**Parker Mine.**—Geo. Gunn, Nicholas French and James Night have just concluded the work of running a 70-ft. tunnel on the Parker mine at Bald Butte, owned by Ed Edge, says the Marysville "Mountaineer." Some very good ore was struck during the progress of the tunnel.

(From our Special Correspondent.)

**Empire Group.**—The recent purchasers of this property at Marysville from the Golden Leaf Company, of London, England, have been engaged for several months past in opening up and cleaning out the Empire and Whip-poor-will mines and making test runs on the ore. They have exposed in these two mines from 40,000 to 50,000 tons of ore of a grade sufficiently rich to net them several dollars per ton, and they expect to start up their 60 stamp mill in the near future and will treat 150 tons per day. This property, that was thought by some at the time of purchase to have been worked out, is proving to be a good mine. The proprietors expect to continue their explorations in the Bell Boy and Gleason, Smithville and the Cornucopia, where large bodies of rich ore are known to exist. These gentlemen have recently released their bond and lease on the Piegan mine, having found sufficient ore in their own properties to keep their mill running to its fullest capacity.

## Madison County.

**Madison Gold Mining Company.**—This company has been organized by W. A. G. Birkin and M. M. Freed, who represent the English syndicate, which has recently purchased a group of old properties on the Big Hole River, about 10 miles from Melrose. A 40-stamp mill is to be erected at once.

**Summer Placer Mining Company.**—George Henderson, James G. Van Marten, Jr. and D. C. Calkins have incorporated this company. The capital stock is \$100,000, and the principal office will be at Virginia City.

## Missoula County.

(From our Special Correspondent.)

**Iron Mountain Mining Company.**—This company on September 7th resumed sending concentrates to the Tacoma smelter at the rate of a carload a day; 35 carloads per month will probably be their average shipments the next year. Average value, \$800 to \$1,000 per car. The force of laborers has been largely increased in the mine. Present development is sufficient to keep them going a year without further developments. In the deepest workings the mine looks as well as at any stage before, yielding 90 to 100 oz. silver and 48 to 50% lead per ton.

## Silver Bow County.

**American Developing and Mining Company.**—This company has declared a dividend of 12½c. per share, payable October 11th at its office in Butte. The amount of its dividend is \$30,496.20, making a total paid by the company since January 1st, 1894, of \$52,154.50.

**Butte & Boston Mining Company.**—The final negotiations for the transfer of the Davis stock in this company to the Bigelow interest have been completed and the stock, it is said, has been turned over.

## NEVADA.

## Elko County.

The following are the latest reports of the mine superintendents:

**Belle Isle.**—The north intermediate drift above the 250 ft. level extended 9 ft. The vein in the face is looking better.

**Navajo.**—The crosscut on the 150-ft. level has been cleaned out and advanced 4 ft. Rock hard but breaks well.

## Lincoln County.

**Flagstaff.**—The lessees of this mine in the Ferguson district have drifted 75 ft. southeast of the old workings in search of the ledge, and have recently struck two seams carrying a fair amount of gold. These, it is believed, are connected with the old vein, and its development is being pushed.

**Gold Cup.**—The lessees of this claim at Ferguson, have recently opened up a 4-ft. vein of good ore.

The find was made in the new shaft, which is now down 70 ft.

## Lyon County.

**Red Jacket.**—Mr. H. C. Biggs, owner of this mine, has contracted for a mill to be erected at Silver City to treat the ore from this mine.

## Storey County—Comstock Lode.

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

**Chollar.**—The west crosscut No. 2, 75 ft. south of north line on the 100 level, has been advanced 12 ft.; total length 481 ft.; face is in soft porphyry. The west crosscut 30 ft. south of our north boundary, 450 level, has been extended 26 ft. during the week; total length, 32 ft.; face in porphyry. The crosscut has passed through 6 ft. in width of ore, the car and face samples from which run from \$26 to \$60 per ton. We stopped the crosscut and are now drifting south on the ore, the drift is now out 5 ft.; face is considerably mixed with waste, but shows a streak of ore 18 in. on the east side. Are making good progress with the repairs at various points.

**Consolidated California & Virginia.**—On the 1650 level we have continued to stoop out ore from the new ore body from the south drift No. 3 (the fourth floor), up to the ninth floor, which is one floor above the sill floor of this level. The faces of the stopes are looking as well as heretofore. The south compartment of the upraise, of the size of one square set of timbers, which was being carried up from the sill floor of the 1700 level, has been connected with the fourth floor, all the way in good ore. From these openings we have extracted during the week 250 carloads of ore—about 347 tons—the average assay value of which, per mine car samples, was \$69.51 per ton. We have shipped during the week to the Morgan mill, 777 tons, 1,840 lbs. of ore, the average assay value of which, per railroad car samples, was \$56.15 per ton. The average assay value, per battery samples, of all the ore worked at the mill during the week (691 tons) was \$60.75 per ton. Bullion now on hand in our assay office—assay value—about \$22,300.

**Gould & Curry.**—On the 200 level the north drift, started from west crosscut No. 5, 1,115 ft. from northwest drift, has been extended 12 ft.; total length, 266 ft.; face in porphyry and stringers of quartz.

**Hale & Norcross.**—On the 975 level, advanced north drift 13 ft.; total length 87 ft. Face in porphyry. On the 1,100 level, north drift was advanced 14 ft.; total length 100 ft.; face in quartz and porphyry.

**Mexican.**—On the 1,465 level the west crosscut started from the top of the upraise which was carried up 45 ft. above the sill floor of this level at a point 40 ft. west from the main north drift and 100 ft. north from the south line of the mine, has been extended during the week 15 ft.; total length 404 ft.; face in porphyry, showing fine lines of quartz. As joint work with the Ophir company, are making repairs in the Ophir shaft at the south end of the 1,465 station, also near the 1,100 station.

**Ophir.**—On the 1,465 level the upraise started at a point 70 ft. in from the mouth of the east crosscut, started from a point in the main north drift 124 ft. north from the main east crosscut from the Ophir shaft, has been carried up 3 ft.; total height 73 ft.; face in porphyry, clay and quartz of low value. At a point 62 ft. up the upraise we are cutting out a small station from which to run a west crosscut.

**Potosi.**—South drift, on the 450 level, has been extended 13 ft.; total length, 656 ft. Face in porphyry. Crosscut No. 5, started from the south drift, 450 level, is out 24 ft.; face in porphyry. Good progress is being made in cleaning out the winze from the surface, which has been opened and retimbered for a depth of 70 ft.

**Savage.**—On the 1100 level in the north lateral drift, started from the east drift, they continue to extract ore on the sill floor upward to the third floor. During the week we have hoisted 62 cars of ore from this level. Car samples average \$22.10 per ton. On the 1050 level, in the east drift, at a point 35 ft. from the south ore stopes, they have started a south drift, and advanced same 11 ft.; face in quartz giving fair assays. The west crosscut, started at a point 30 ft. north of the south boundary, was advanced 10 ft.; total length, 33 ft.; face is in quartz and porphyry. On the 1100 level the north lateral drift from the station was advanced 9 ft.; total length 328 ft.; face in clay and porphyry. The east crosscut started in the north lateral drift opposite the west crosscut, was advanced 11 ft.; total length 22 ft.; face is in quartz, clay and porphyry.

**Sierra Nevada.**—The north lateral drift at a point 385 ft. east from the mouth of Intermediate tunnel, has been advanced 17 ft.; total length, 127 ft.; face in quartz, clay and porphyry. The southwest drift at a point 170 ft. west of the mouth of the Dayton tunnel, was advanced 35 ft.; total length, 120 ft.; face in clay and porphyry. The east crosscut from the north lateral drift, 450 ft. north of the west drift, 1,520 ft. west of the shaft, 900 level, has been advanced during the week 25 ft.; total length, 51 ft.; face in clay and porphyry. The west crosscut from the Union Consolidated south lateral drift from the west drift, 1,520 ft. west of the shaft, 900 level, has been extended 25 ft. during the week; total length, 51 ft.; face in clay and porphyry.

## NEW JERSEY.

## Sussex County.

The State Board of Taxation of New Jersey has ordered that the assessors of the townships of Har-

dyston and Sparta, in Sussex County, shall make a re-assessment of the properties belonging to the New Jersey Zinc and Iron Company, the Sterling Iron and Zinc Company, the Passaic Zinc and Iron Company, and the Lehigh Zinc and Iron Company, located in those townships. The action is taken under this year's amendment to the law defining the authority of this board, which authorizes them to order a re-assessment whenever it is shown to them that there is ground to believe that the original assessment is unjust. It has been taken on application of citizens of Hardyston township and, is undoubtedly the result of the suit over the lease of the Franklin property last summer, in which testimony was given as to the great value of the mineral deposits, calling attention to the comparatively small valuation put upon them by the assessors.

## NEW MEXICO.

## Colfax County.

**La Belle Camp.**—This new camp, which is attracting much attention, is 4½ miles northwest of the western boundary of the Maxwell grant and 13 miles from Elizabethtown. The distance from Catskill by a good wagon road is 35 miles. There are 150 to 200 miners there, mostly from Creede, Cripple Creek and Amizett. A new road is being built to Antonito, and a townsite laid out. It is a gold camp, and some 70 claims have been already located at San Luis, the headquarters of the grant, and the mining rules are about the same as those on the Maxwell grant. Mr. M. P. Pels is president, and E. C. van Diest, manager, of the Cosulla grant, on which these mines are located. No copper is found in the ore. Negotiations for the erection of a large stamp mill are in progress.

## Grant County.

**Grand Central Mine.**—On this mine, at Central, Potter & Craig, the lessees, have a drift in 55 ft., and intend to run it about 100 ft. further. A shipment of four tons of first-class ore was recently made, which gave a very good result in silver, carrying some gold also. A carload of second-class ore is ready for shipment.

**Hanover Iron Mine.**—About 35 men are employed here and are making shipments of about 100 tons per day. The force is to be increased, as it is said that a larger quantity can be disposed of to advantage.

**Ivanhoe Mining Company.**—A small force is now employed in this mine repairing the timbers and making arrangements for a general renewal of work. The company is negotiating for a lease of the old Santa Rita Smelting Works.

**Ohio Mine.**—The owner, N. Bell, has lately put a force to work on this mine at Pinos Altos. Work is being done driving the main tunnel and sinking the main shaft. The tunnel now taps the vein at a depth of 465 ft., and there the vein is from 4 to 6 ft. wide. The shaft is down 195 ft. and the ore is from 4 to 5 ft. wide at that point.

**Turquoise Mines.**—R. B. Kevorkian, the manager of Mr. Topakyan's turquoise mines in the Burro mountains, has been busy at work opening these properties with the most satisfactory results, says the Silver City "Sentinel." The indications of turquoise on the mines were good, and old Aztec workings were found in the immediate neighborhood before Mr. Topakyan bought them. Under Mr. Kevorkian's direction these mine are beginning to show up well, and genuine turquoise is being got out now that the development work is going ahead. Turquoise from this camp is already making a name for itself for its fine color and unfading quality. If these properties continue to improve they will become one of the noted producers of turquoise in the world.

## Rio Arriba County.

The recently discovered mines near Vallecitos are attracting many miners. The leads so far opened show free gold. On the first discovery made by J. M. Wilcox, the shaft is down 50 ft., and at that depth some silver is also found. Some 20 claims have been located in the new camp and a mining district is to be organized there.

## Socorro County.

**Confidence Mine.**—The new mill at this mine is completed, and was to be started up this week on ore from the mine, a large quantity of which is ready.

**Deep Down.**—The recent strike in this mine, in the Mogollon district, continues to show well. The face of the drift shows a body of ore 5 ft. in width, the chief value of which is in gold. The mill was started up last week, and is running steadily, a good supply of ore being already on the dump.

## Taos County.

**Cochiti District.**—In Santa Fe, September 27th, the Court of Land Claims gave its decision in the Cochiti cases. These cases, says the Santa Fe "New Mexican," included five conflicting claims to the Cochiti property. The first of these was the Rito de los Frijoles grant, in which George N. Fletcher and others were claimants. The tract claimed under this grant started at the Rio Grande and ran westward into the Cochiti district. The court rendered a decision rejecting the Frijoles claim and taking the position that there was no grant, and that the right to settlement was merely permissive on the part of the government. The next claim was the Borrego Springs grant, the western part of which was claimed to coincide with the Cochiti property. The court confirmed only that part of this claim lying south of the Cochiti grant. This confirmed

territory begins at the southern boundary of the Cochiti Indian lands, runs north two leagues and west from the Jemez pueblo two leagues. The confirmation covers 20,000 acres, whereas the original claim was for 60,000 acres. The third conflicting claim was the San Jose Springs grant, which lay mostly southwest of the Cochiti grant. This was confirmed according to the boundaries in the original act of juridical possession, the confirmed territory amounting to four square leagues. None of this property, however, was confirmed to the extent of conflicting with the Cochiti grant. The fourth conflicting grant, the Peralta claim, covering about 400,000 acres and including all the foregoing tracts, was rejected. These four decisions cleared the way for the issue between the government and the holders of the Canada de Cochiti grant; and it was just here that the battle royal of the whole controversy took place. The decision in this claim was looked forward to with the greatest interest, as it was regarded as the oldest and most formidable that the government would have to contend with. The main point of contention was as to the location of the north boundary, the government contending that this boundary was located at the ruined pueblo of Cochiti, in the Cochiti canyon, near Allerton, and the claimants contending that the northern boundary was the Pueblo Viejo, six miles farther north. The decision of the court was a sweeping victory for the government and the miners, for not only did it hold that the northern boundary was the old Pueblo de Cochiti, near Allerton, but that the western boundary, as well, runs through the same point north and south. This decision was rendered by Judge Sluss, and was concurred in by the whole court. The effect of this is to make the confirmed Cochiti grant the property bounded on the south by the north boundary of the land belonging to the Cochiti Indians; on the east by the Rio Grande; on the north by a line running east and west through the old pueblo just northeast of Allerton; and on the west by a line running north and south through the same point, altogether about 3,000 acres. In other words, that pueblo constitutes the northwest corner of the confirmed grant, and none of the property lying north or west of the canyon of Cochiti is in the confirmed grant. The effect of this is to throw open the most valuable part of the Cochiti district, Bland and its surrounding country, and Allerton also lying without the grant. The attorneys in this case were Judge Laughlin, Mr. John H. Knaebel, Mr. C. H. Gildersleeve, Mr. C. H. Toll and United States Attorney Reynolds. The latter, on behalf of the government, made a very brilliant argument. Mr. Toll and Mr. Gildersleeve had been employed by the miners of the Cochiti district, and both have worked in season and out of season for their cause. Mr. Toll spent 40 days personally inspecting the entire Cochiti country. Mr. Gildersleeve also spent several weeks there and sent to Peru to get a statement from Prof. Ad. F. Bandalier, the noted archaeologist, who had devoted months to studying the Cochiti region; Mr. Gildersleeve also personally searched the government archives and developed the original of Diego de Vargas' official diary, over 200 years old, which directly referred to the Cochiti country and the several grants in that locality. The real effect of the decision is to throw open as public domain all that vast territory wherein are grouped the principal mines of the Cochiti district. The grant claim was for 114,000 acres, which took in Pino, Colla and Peralta canyons, Allerton, Bland City and the rich adjacent territory, but the act of confirmation gives the claimants scarcely 3,000 acres in the Canada de Cochiti lying east of the Allerton townsite and south of the original pueblo of Cochiti—where De Vargas found the Indians entrenched in the year 1694 and whence, four years after he conquered the pueblos of Santa Fe, he, after many hard battles, succeeded in dislodging them and brought them out of this wilderness of rocks to the Rio Grande valley and located them in a new pueblo which they to-day occupy. The news of the decision was telephoned over to Allerton and Bland and a message came back stating that the whole district was celebrating.

NEW YORK.

Erie County.

Seneca Natural Gas Company.—This company has been organized to bore for oil and natural gas at West Seneca; capital, \$100,000; directors, Eugene M. Cobb, Henry H. Argue, Philip W. Roth, C. T. Sloan, Buffalo, and John Tonkin, Jr., Oil City, Pa.

OREGON.

Baker County.

Brazos.—One-fourth interest in this new mine was sold recently to parties from Idaho for \$5,000. The claim is to be worked actively.

Virtue Mine.—The suit of Clarno, assignee, against Grayson is now being tried. It involves the title to the mine, the plaintiff claiming it as assignee of the Virtue Mining Company under a working bond granted by defendant. The latter, the original owner, is now in possession, and claims that the company forfeited all right in the mine, having failed to comply with the conditions of the bond.

Union County.

Dolly Varden.—This mine, near Sparta, will soon start up the mill, considerable ore having been taken out.

Gem.—The buildings at this mine, near Sparta, are completed, and everything is in order for winter.

Ollie Woodman.—Work is going on steadily at this mine.

PENNSYLVANIA.

Anthracite Coal.

The trustees of the Philadelphia City Trusts have been making their yearly visit of inspection to the Girard estate collieries.

Greenwood Coal Company.—In Scranton, October 6th, in the case of Labar against this company, the court gave a verdict in favor of the plaintiff. The decision was of some little interest as setting a value upon culm. The plaintiff bought a culm pile for which he paid \$500. The Greenwood company afterward purchased the ground on which the pile was and removed a portion of it, when Labar brought suit, claiming damages for 4,000 tons of the culm removed. The company claimed that the culm became real and not personal property and went with the land upon which it was piled, but the court sustained plaintiff's claim and rated the damages at 10c. a ton.

Hughes Estate.—Margaret S. Denniston, executrix, and Abram Nesbitt, executor of the estate of Maria Hughes and others, have filed a suit in assumpsit against coal operator John C. Hapdock for \$191,265. It is alleged by the plaintiffs that the defendant leased a tract of 11½ acres of coal land from the Hughes estate at an annual rental of \$14,400, and that a statement of the amount of coal mined has never been made. The plaintiffs, however, claim that 245,000 tons have been mined from the property.

Luke Fidler Colliery.—A disastrous fire started at this colliery, at Shamokin, on October 8th, due to the carelessness of men engaged in repairing the timbering in one of the shafts. Five men were killed, and it is feared that the mine will have to be flooded before the fire can be extinguished. This will entail a very heavy loss. The coal run portion of the Fidler working is connected with the Gimlet and Hickory Ridge collieries, and in consequence they are not working. About 1,000 men were employed at the Luke Fidler colliery and another 1,000 at the Gimlet and Hickory Ridge collieries. These men will be idle for some months.

Philadelphia & Reading Company.—A novel application was made October 6th, when the attorneys representing some employees of the company appeared in the United States Circuit Court and asked for an order to prevent the receivers from discharging the men on account of their connection with a labor organization. The court took the position under consideration.

Truman Dodson Coal Company.—This company, says the Scranton "Tribune," has been doing considerable work at the Kaskawilliam colliery in order to prepare for a big output of coal. It is one of the finest collieries now in the region. The company has opened up 375 ft. of a new slope and has found several veins of coal varying from 7 to 22 ft. in thickness. The compound duplex engines, built especially for the company at the Janesville shops, have been erected. Patent jigs have also been introduced and every care will be taken to send nothing but pure coal to market. When the shipment of coal will take place the Kaskawilliam will be one of the model collieries in the Schuylkill coal region. Superintendent D. J. Thomas, of Morea, has charge of the improvements.

Bituminous Coal.

Somerset Coal and Coke Company.—This company has just been organized with \$25,000 capital stock. The directors of the company are Frank C. Angle, E. Common, Ira M. Forrester, E. F. Hoffman, John L. Campbell, John C. Peifer and James C. Heddens, of Davidsville. The company owns coal lands in the vicinity of Listie, and propose to operate mines and manufacture coke in or near that place.

Berks County.

Jones Iron Mines.—The negotiations between the Brooke Iron Company, of Birdsboro, and the Phenix Iron Company for the purchase of these mines, near Joanna, have been concluded by the purchase of the ore right by the former company. The machinery and building will be disposed of at public sale. It is said that ore can be mined at these mines very cheaply.

SOUTH DAKOTA.

Clark County.

South Dakota Mining Company.—The new ore body lately uncovered in the Katie mine has proved more extensive than at first expected. It now shows a face 22 ft. wide and 10 ft. thick of fair-grade ore. The tunnel has been widening out into a chamber and development work is to be extended. The company is about to begin some experiments with an electrolytic process for working its refractory ores.

Fall River County.

It is said that A. B. Clark and others, the owners, intend to begin working the coal property near Edgemont, in Cheyenne Canyon, which was explored some time ago. The workings already made consist of five drifts, the longest of which is in 200 ft. Recent analyses of the coal, it is said, show it to be of fair quality.

Lawrence County.

Golden Reward Mining Company.—The cyanide mill is rapidly assuming shape in its interior, says the "Black Hills Times." Six of the steel solution tanks are now in place on the third floor of the

building and three more on the first floor. The leaching apparatus, consisting of revolving barrels, similar to those in use in the company's chlorination plant, will occupy the second floor. These barrels are expected to arrive in a few days, and will be put in place upon their arrival. A covered tramway is now being built to connect with the crushing department of the chlorination works, where the ore for the cyanide mill will be pulverized. From the progress now being made, the new plant will be in operation in a few weeks.

Homestake Mining Company.—This company has added to its property the Alice mine, situated on the divide between Central City and Terraville. The claim is an old one, and has been worked by John R. Wilson and others, the owners, steadily. It adjoins the Deadwood-Terra property.

UTAH.

The shipments of ore and bullion from Salt Lake City for the week ending September 29th amounted to 510,206 lbs. of ores and 715,077 lbs. of bullion.

There was but little difference between the total valuations of reported bank ore and bullion receipts and shipments for the week ending October 6th, and the week previous, says the Salt Lake "Herald." Had full statements been submitted, however, the total would have been materially increased. A certain number of the heavy producers do not make their shipments public, among them being several gold producers. During the week the Ontario shipped \$27,000 worth of silver to San Francisco and the Daly \$14,000 worth more, none of which is included in the week's total of \$145,626. The summary of the week's business is as follows: McCornick & Company, \$74,650; T. R. Jones & Company, \$38,200; Wells, Fargo & Company, \$16,843; Walker Brothers, \$15,933; total, \$145,626 for the week.

Beaver County.

Horn Silver Mining Company.—At the annual meeting in Salt Lake, October 2d, the following board of directors was elected: Allan C. Washington, Juan M. Ceballos, P. T. Farnsworth, M. Bache, C. E. Whitlock, Theodore E. Moore, John Sharp and Frank W. Jennings. At a subsequent meeting of the board of directors the following executive officers were chosen: President, Allan C. Washington; vice-president, Juan M. Ceballos; secretary and treasurer, Ambrose I. Harrison. Mr. Farnsworth retains the management of the company's interests. The only new director is Mr. Ceballos, of New York, who, it is understood, has recently acquired a large interest in the property.

Emery County.

Union Pacific Coal Company.—This company's coal mine at Scofield are now employing 100 men.

Winterquarters Coal Mines.—These coal mines at Scofield are now running full time, with 200 men.

Juab County.

Bullion-Beck & Champlin Mining Company.—An important suit has been begun in the District Court at Provo against this company by the Almo Mining Company, a new incorporation, which owns some adjoining claims to the Bullion-Beck grounds. The plaintiffs ask a temporary injunction against the Bullion-Beck company, claiming that the workings in that mine have cut through the lines between its property and that of the Almo company. The court ordered surveys and maps to be made, in order to determine the true lines of the property.

Summit County.

Ontario Mining Company.—For the week ending September 29th this company shipped 42,807½ oz. of fine silver, and the Daly 21,680 oz. of fine silver, all of which went to San Francisco.

Tooele County.

Mercur Gold Mining Company.—But one more shipment of cyanides, and that a small one, will be made by this company during the next two months, says the Salt Lake "Herald," the reason being the general close-down just ordered by the officers of the company, in order that the contemplated increase in the capacity of the mill may be made. This will require about six weeks, and some two weeks more must be allowed for the trials of the new plant. The mine force has been laid off and at the mill the clean-up is being made preparatory to a general close-down. Materials for the enlargement of the plant are already being delivered on the ground, and the machinery being shipped. The capacity of the improved plant will be 150 tons. Some delays have been experienced by the Mercur & Salt Lake Railroad, but they announce that the road will be pushed to an immediate completion. There is already on the ground sufficient material to complete the first two miles.

WASHINGTON.

King County.

Oregon Improvement Company.—An explosion occurred in the fifth level of this company's mine at New Castle, October 10th. One miner was killed, 2 fatally burned, and 10 less severely injured, while nearly everyone employed on the level was thrown down by the shock. There has been little or no gas in the mine, and it is believed that the explosion was due to coal dust.

Kititas County.

Wenatchee Mining Company.—This company, at Wenatchee, Wash., has been incorporated. Capital stock, \$18,000. Incorporators, M. J. Carkeek, A. McIntosh, Thos. Burke.

Okanogan County.

(From our Special Correspondent.)

Messrs. R. N. McLean, W. D. Mott, G. S. Helfrey and others have organized the Mineral Hill Mining Company, with a capital of \$300,000 in \$1 shares. The company owns the Grover Cleveland mine at Mineral Hill, near Conconully. Work is to be started to develop at once.

WISCONSIN.

Iron—Gogebic Range.

Colby Iron Company.—This company is preparing for an extensive winter's work. Men are at work sinking No. 7 shaft below the dyke, and will sink No. 8 and 9 shaft to what is commonly called the Lake of Ore. This will furnish employment for 300 men in addition to the 250 now employed.

FOREIGN MINING NEWS.

SOUTH AFRICA.

Transvaal.

The seam of coal near the Buffelsdoorn mine is being opened. The top seam is reported as being 7 ft. thick, of fair quality, and the lower seam, about the same thickness, an excellent steam coal. It will be delivered at the mine for £1 per ton.

The De Kaap District reports for the half-year to June 30th a total output of 51,000 oz. gold, against 31,000 oz. for the corresponding half of last year; 32,500 oz. in 1892, and 28,000 oz. in 1891. The chief mine of the district is the Sheba, which produced this year 39,819 oz., or 78% of the total output of the district.

African Gold Recovery Company.—The gold reported by this company as obtained by the cyanide process in the Witwatersrand district was 64,258 oz. in August, the largest amount ever reported for one month. For the eight months to August 31st the amount recovered by the cyanide process was 453,208 oz., against 190,703 oz. for the corresponding period in 1893, and 107,710 oz. in 1892. The company has declared a dividend of 10% for the half-year ending June 30th.

Witwatersrand.—The July return of the Witwatersrand Chamber of Mines gives the following analysis of the gold output of the district for the month: Mill, 108,660 oz.; concentrates, 7,258 oz.; tailings, 48,241 oz.; alluvial, 80 oz.; received by banks from other sources, 3,714 oz.; total, 167,953 oz. The output from tailings was all obtained by the cyanide process, with the exception of 755 oz. by the new Siemens-Halske process. The concentrates are chiefly pyritic and are treated by chlorination. The total value of the output is given as \$2,777,950, showing that the bullion was about the usual average of Witwatersrand gold, 0.800 fine, so that the product for the month was equivalent to 134,363 fine ounces of gold. The largest producers for the month were: Langlaagte Estate, 160 stamps, 11,215 oz.; Robinson, 70 stamps, 11,131 oz.; Crown Reef, 120 stamps, 10,621 oz.; New Primrose, 7,333 oz.; City & Suburban, 130 stamps, 6,065 oz. The total tonnage of ore crushed was 242,173 tons; of tailings worked, 226,626 tons. The average mill result from ore was 0.4475 oz., or \$7.74, per ton; from tailings, 0.2125 oz., or \$3.10, per ton.

The telegraphic report gives the output of the district for August at 174,977 oz. of gold, which is the largest ever reported in one month; it is 5,204 oz. greater than that of May, 1894, heretofore the "record" month. The total output for the eight months to August 31st was 1,316,668 oz., against 927,200 oz. for the corresponding period last year; 763,305 oz. in 1892; 437,135 oz. in 1891; 306,947 oz. in 1890; 230,428 oz. in 1889; and 107,103 oz. in 1888.

LATE NEWS.

The Gellivara iron mines in Sweden will this year make up their total shipments to 500,000 tons of iron ore.

On October 9th the new mills were started up at the American Company's tin plate factory in Elwood, Ind., and President Leeds has informed the men that there will be no reduction in wages.

The Canadian Society of Civil Engineers, at its first regular meeting of the season in Montreal, October 11th, listened to a paper on "Building Railroads over Peat Bogs," by Mr. D. A. Stewart, which was followed by a discussion of the subject.

The Solvay Process Company, of Syracuse, N. Y., has purchased the blast-furnace plant of the Onondaga Iron Company, which has not been in operation for several years. The Solvay company will utilize the plant for its own manufacture.

Dispatches from Victoria report the formation of a combination controlling the British Columbia coal mines. The dispatches further add that there is to be an immediate increase in the prices charged for coal, which is, as the residents of the Pacific Coast know, already high.

A correspondent informs us that the great deposits of copper pyrites at Sulitjelma in Norwegian Lapland, which have been opened to a small extent during the last four years, are now to be worked on a large scale. The company which owns them is preparing to put up the necessary plant.

The Foundrymen's Association at its regular meeting in Philadelphia last week received reports from the price committee and the executive committee, showing some improvement in business, but little change in prices. Nominations for officers for the next year were made. A paper on the "Herbertz Steam Jet Cupola," by Mr. J. B. Nau, was read, with a criticism on the same by Mr. Thomas D. West. The two papers together were discussed by the members present.

Dr. Francis M. Simonds has opened a laboratory at No. 20 Platt street, New York, where, besides investigations and experiments in chemical and metallurgical processes, he proposes to offer facilities to business men who wish to work or experiment for themselves in any particular line, and will instruct them or help them in carrying out their ideas, giving personal attention to the work. The opportunity of obtaining such assistance from a competent chemist will doubtless be welcomed by many.

The exports of mineral oils from the United States for the eight months ending August 31st are reported by the Bureau of Statistics, Treasury Department, as below, in gallons:

	1893.	1894.
Crude oil .....	75,791,262	75,257,614
Illuminating oils .....	459,486,468	472,147,697
Lubricating oils .....	21,729,073	24,980,784
Naphthas .....	8,782,214	7,913,542
Total .....	565,789,617	580,609,637

Lubricating oils include heavy oils and paraffin. In addition to the above there were exported this year 2,035 bbls. oil residuum and tar, against 11,668 bbls. last year.

Four men were killed, two fatally injured and several others badly burned by the explosion of boilers at the Henry Clay colliery. The entire steam-supplying plant of the mine, consisting of 36 boilers, was totally demolished, and in addition to the money loss, which will aggregate \$30,000, the Henry Clay, Big Mountain, Sterling, and Peerless collieries will be unable to resume operations for at least a month. The explosion is the worst of its kind that has ever occurred in the region, and its cause is a mystery. The bodies of the men killed were frightfully mutilated, and the injuries and burns of the wounded ones are of the most painful character. When the explosions occurred the boiler-house roof was blown into the air, and flying bricks, sheets of corrugated iron, and pieces of the big boilers were hurled in every direction. The air was filled with escaping steam and debris for a space of 400 yards about, and many of the employees narrowly escaped death. The report of the explosion was heard more than two miles. The boiler at the western end of the house is supposed to have been the first to explode, and the adjoining boilers blew up in quick succession, the repeated explosions resembling the roar of heavy artillery. Only 9 of the 36 boilers escaped complete destruction, and even these were so badly damaged that they are useless. The half of one boiler was hurled a quarter of a mile. Another crushed through the tiphouse and came near killing the engineer there and several employees. Counting the four collieries that will be made idle for a month by the accident, the total loss will reach \$100,000.

The following late notes from the Cripple Creek mining district in Colorado are from our special correspondent in that noted camp:

The machinery has arrived for the new chlorination plant at Gillette and switches have been constructed to the building.

Colorado Springs Mill.—The laboratory and assay furnace connected with this mill burned to the ground on the night of October 4th. This mill has of late rapidly grown into favor as a custom mill, owing to the systematic work of Professor Malins in the laboratory, and the loss of his notes respecting the ores of the camp, their complete analysis, and the suitability or otherwise for amalgamation and concentration, is nothing short of a public calamity.

Dolly Varden.—This property, owned by the Enterprise Mining Company, is situated on the north slope of Little Bull; it is being worked by lessees, and with gratifying results. The first car, 10½ tons, shipped September 30th, gave 27 oz. of gold; the second car, 11½ tons, shipped October 3d, gave 25.5 oz. gold, with 4 oz. of silver, per ton, and the third car is now ready for shipment. The second class ore assays from 6 to 8 oz. This discovery was found by a Swede boy about 17 years of age, who persuaded his father to take a lease and bond on it. The boy owns one-sixth interest in the lease.

Galena.—This mine, owned by the Iron Mountain Mining and Milling Company, recently shipped several tons to the Omaha & Grant smelter, which assayed 3.68 oz. of gold, 14.30 oz. of silver and a large percentage of galena, giving a value of \$82.40 per ton. The shaft has been sunk 90 ft., and preparations are now being made to commence drifting at this the No. 1 level. The pay streak is from 10 to 12 in. wide, presumably a telluride ore. Some rich ore from the bottom of the shaft as well as from the station and drift is now being sacked, and a carload lot will be ready for shipment in a few days. This property is situated on Red Mountain about 2½ miles northwest of town and is the first shipper in that section.

Ida Bell.—This claim, one of those owned by the Orphan Bell Company on Bull Hill is also leased out in 75 and 100 ft. lengths. One party of lessees was yesterday mining with finger nails and pocket knives. The mud seam at a depth of 8 ft. from surface was 2 in. wide, the lowest assay giving 16 oz. of gold. In some respects it bears a striking resemblance to the Pike's Peak seam in June, 1893, when work was first commenced.

Moose Mine.—This is now the deepest mine in the district, having attained a depth of nearly 400 ft., and the vein still maintains its size and value. From the first car of ore shipped this company paid for the claim and all labor done for nearly 12 months prospecting and building.

Mountain Monarch.—This property, situated north of the Dolly Varden, and owned by the Gold Standard Company, is leased in 100 and 200 ft. lots, and the lessees in searching for the vein save all the flat rock; several tons of this flat rock sampled by and sold to the Cripple Creek sampler netted about \$40 per ton.

Portland Mining Company.—The output from these mines for the month of September is estimated at \$130,000. One car load lot of 8.56 tons assayed 11.55 oz. of gold per ton, netting the company over \$16,500. This is the richest carload lot that ever left the camp. The Portland once before shipped a carload which yielded 99.5 oz. The Victor also shipped 8½ tons, which gave 99.5 oz. The Portland now employs a force of 120 men.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Oct. 12.

Statement of shipments of anthracite coal (approximate) for week ending October 6th, 1894, compared with the corresponding period last year:

Regions:	Oct. 6, 1894.		Oct. 7, 1893.		Difference.
	Tons.	Tons.	Tons.	Tons.	
Wyoming region.....	423,748	518,502	Dec. 95,054		
Lehigh region.....	124,351	171,870	Dec. 47,519		
Schuylkill region.....	206,608	314,094	Dec. 107,886		
Total.....	754,707	1,004,766	Dec. 250,059		

Totals for year to date. 30,317,753 32,226,747 Dec. 1,908,994

PRODUCTION OF BITUMINOUS COAL, in tons of 2,240 lbs., for week ending October 6th and year from January 1st:

Shipped East and North:	1894.		1893.	
	Week.	Year.	Week.	Year.
Phila. & Erie R. R.....	1,226	55,732	63,488	
Cumberland, Md.....	77,457	2,183,096	3,177,678	
Barclay, Pa.....	↑	*16,154	38,977	
Broad Top, Pa.....	8,436	272,690	467,445	
Clearfield, Pa.....	79,804	1,903,877	2,979,079	
Allegheny, Pa.....	33,631	886,617	964,738	
Beech Creek, Pa.....	↑	↑	2,801,840	
Pocahontas Flat Top.....	↑	*2,485,132	2,175,931	
Kanawha, W. Va.....	*83,200	*1,911,518	2,496,071	
Totals.....	283,754	9,714,816	14,565,258	

\* To October 1st.  
\*\* To September 22d.  
† Returns not received.

Shipped West:	1894.		1893.	
	Week.	Year.	Week.	Year.
Pittsburg, Pa.....	32,013	1,050,328	923,291	
Westmoreland, Pa.....	43,746	1,199,178	1,466,206	
Monongahela, Pa.....	7,621	522,179	532,065	
Totals.....	83,380	2,771,685	2,921,495	
Grand totals.....	367,134	12,486,501	17,486,753	

Anthracite.

It is difficult to see at this writing wherein the anthracite coal market this week differs from our last review of the trade. The situation is practically the same, ruling conditions having changed since then but little.

The inquiry for coal has improved somewhat. The cool weather of the past week has induced householders to buy more freely; at the same time dealers are still receiving coal on old orders, so that they feel no urgent need of making new contracts just now. Owing to this the market has been rather more quiet than many optimistic sellers expected.

The improvement in the demand has been chiefly in the way of orders for prompt delivery, and the buyer has gone chiefly to middlemen, who are not overburdened with scruples as to selling coal below the May circular. We have no hesitation in asserting that the bulk of the "new" business done during the past fortnight has been done by middlemen, who bought very cheaply a month or two ago, and can now afford to undersell the producers who supplied them.

To the "Engineering and Mining Journal" is due the credit of first bringing to the attention of the public the fact that the coal trade was all but demoralized. Figures and other specific data were given in this column showing as far back as June that not a solitary producer was living up to the agreement to maintain prices and restrict the output. Many newspapers reprinted our articles, giving proper credit, but certain papers, among others some self-styled "financial papers" interested chiefly in the fluctuations of the stocks of railroad companies controlling coal properties, have continued the alarmist reports which are perfectly true at the time, this appeared in the "Journal," or say, two months ago, but were uncalled for and inaccurate at the present writing.

After a careful canvass of the trade we find that the companies are not doing much "cutting" now. It is only justice to them to say as much, and it is



also only justice to say that they are doing very little new business. Nor are the very low prices which obtained three weeks ago and which we were the first to report, so easy to get now. The free-burning coals, owing to the character of the sellers, chiefly independent operators, may be had at less than the May circular, but the companies are not "shading" to any extent. Perhaps, did the opportunity offer, they might do so, but the fact remains that they are adhering to the prices established at the last meeting more closely than for months past. At the same time anyone can buy good coals at less than the schedule rates by applying to the above-mentioned operators or to well known middlemen. Fair quotations to-day for good coals, alongside New York harbor, are: Stove, \$3.35@3.45; chestnut, \$3.35@3.40; egg, \$3.25@3.35, and broken, \$3.15@3.25. These figures may be shaded, but it is doubtful whether the coal so offered will be of good quality. For the smaller sizes we quote: First-class pea on board, \$2.40@2.60; buckwheat No. 1, \$1.90@2; No. 2, \$1.50@1.60. And it is only fair to add that if certain coals, "slaty" or "rusty," may be had for less, some of the fancy coals are bringing much more.

There is a widespread belief that owing to the small supplies laid in by consumers thus far, the trade from now on will be more active than usual. It is true that people have been more backward in laying in winter supplies, and that they will have to buy more coal in November and December, unless the winter is exceptionally mild, than they have been wont to do in former years. At the same time the tendency to economize in fuel as in other articles of home consumption is so much greater than usual this year that producers cannot afford to disregard it. From the figures thus far received, the output for this month will exceed the allotment of 3,000,000 tons for October. And when one considers that most of the tonnage mined has gone on old orders one wonders what the producers might not do if the demand were greater.

It will take some time to exhaust the stocks in the hands of the dealers and of middlemen. If the sales agents are to get the "official" prices this year they must so regulate their output that there must at no time from now henceforth be any dangerous accumulation of stocks in their storage depots.

**Bituminous.**

During the past week the soft coal trade has been more than holding its own. Some of the companies have been so pressed for coal that they have had to buy or borrow from other producers. There is quite a number of orders in the hands of the companies' shipping agents, a good proportion of which is for prompt shipment, and consignees are urgently demanding their coal. Producers are complying with these requests as fast as their limited shipping capacities permit.

All the companies are making efforts to finish up shipments to the shoal-water points, but there is still left a considerable portion of the usual winter stocks at these places to supply. The demand for prompt shipments is pretty evenly distributed. It comes from all the consuming territories in about equal proportions, and is just now in excess of the supply. All-rail trade is an exception, perhaps, being somewhat easier in its demand, though a good business is also doing.

A number of small consumers who take one or two cargoes a year have come into the market. Some shipments to South America are reported this week, though freights thither are high at present. The demand from retailers is small and little business is doing in that direction by producers.

Prices generally are rather stiffer, though without any advance from last week. We quote the following prices at the various shipping ports: \$1.90@2.15 f. o. b. Norfolk and Newport News; \$2@2.15 f. o. b. Baltimore; \$1.90@2.25 f. o. b. Philadelphia, and \$2.40@2.75 f. o. b. Perth and South Amboy and New York shipping ports.

Transportation from mines to tidewater is slow on all the roads, especially on the Pennsylvania Railroad, on which there is a blockade of coal cars, so that it takes about three times longer than usual for the coal to reach tide. To such an extent has this state of affairs gone that all shippers are allowed to send forward but a limited quantity per day, and in some instances none at all—though in all cases producers are sorely pressed for better transportation facilities. The Pennsylvania has been promising to raise this blockade and it has adopted this method of bringing about relief. Up to date the steps taken have not proven very effective. Cars are naturally not plentiful, and to points on "foreign" lines they are not to be had.

Vessels are in good supply at all ports, owing chiefly to the limited quantity of coal coming to these waters. The gales of the past week have caused many wrecks, and many coal barges have been so severely injured as to necessitate their laying up for repairs.

We quote the following rates of ocean freight from Philadelphia: To Boston and Salem, 70c.; Portland, 70@75c.; Portsmouth and Bath, 75c.; Providence, New Bedford, New Haven, Bridgeport and other Sound ports, 65c.; Lynn, 80@85c.; Newburyport, 85c.; Haverhill, \$1.20 alongside and towages; Wareham, 85c.; Saco, 80c. alongside and towages; Bangor, 80@85c.; Gardiner, 80@85c. alongside and towages.

Baltimore, Norfolk and Newport News are 10c. higher than the foregoing rates.

**Birmingham, Ala.** Oct. 10.

(From our Special Correspondent.)

The coal trade is picking up in a marked degree, especially for the domestic market. Steam coal is in about the same demand as last week, and efforts are made by at least one large company to establish a healthy trade on the Atlantic Coast. Savannah, Charleston and Brunswick are very desirable points to reach, and the railroads are helping this movement in establishing large coal yards. Walker County mines, especially working for the domestic trade, are running full time. Work at Pratt and Blocton is rather slack. The Blue Creek mines are the only busy mines of the Tennessee Coal, Iron and Railroad Company. Prices of domestic coal, screened at mines, is \$1.25@1.40; steam coal, \$0.75@1@1@mines; foundry coke 72 hours, made from washed coal, is quoted \$3 f. o. b. Birmingham.

**Boston.** Oct. 11.

(From our Special Correspondent.)

The week has been a quiet one in the anthracite coal trade. The retailers, while doing a very fair business, are not moving enough coal to warrant their buying very heavy stocks at present to replenish. The companies are said to be cutting the circular price in some instances as much as 25c. per ton. Individuals operators are, of course, even underselling this by 5 or 10c. per ton.

In soft coal business is still very quiet. Deliveries are mostly on short orders and on old contracts. New England buyers are still complaining of the slowness with which Cumberland coal is being brought forward. Other coals are being delivered in this market with dispatch. On cars here the following prices obtain: Cumberland, \$3.20 per ton; Pocahontas and New River, \$3.15@3.20, and Clearfield, \$3.05@3.10.

Freight rates are somewhat stronger, owing to a lesser supply of tonnage. Rates are: From New York, 45c.; from Philadelphia, 70c.; from Baltimore, 80c.; from Norfolk and Newport News, 75c.

The retail trade is of very fair proportions, though the weather has been quite mild for October. What the trade wants is a cold snap to start everything moving. Prices are steady.

**Buffalo.** Oct. 11.

(From our Special Correspondent.)

There is a slight improvement in the anthracite coal trade, on account of the cold weather. Prices nominally unchanged. No particular incidents connected with the business to report.

The bituminous coal trade is quiet, and quotations, though nominally without variation, favor the buyer, in consequence of the large stocks on the railroad tracks. Manufacturers are busy, but do not buy more than is required for immediate use.

Lake freights on coal unchanged, excepting that the rates to Lake Superior declined 10c. on Monday.

The shipments of coal westward from Buffalo from October 1st to 6th, both days inclusive, aggregated 53,808 net tons, distributed as follows: 18,050 tons to Chicago, 12,130 tons to Milwaukee, 15,000 tons to Duluth, 2,000 tons to Superior, 3,480 tons to Toledo, 1,800 tons to Gladstone, 448 tons to Toronto and 900 tons to Sault Ste. Marie. The rates of freight were: 55c. to Chicago, 50c. to Milwaukee, 60c. to St. Ignace, 70c. to Muskegon, 45c. to Hancock, 30c. to Duluth, Superior and Gladstone and 25c. to Toledo. Closing quiet.

Vessels will pass through the Canadian Sault canal about November 1st, but the formal opening will not take place until the spring of 1895. It is a splendid piece of work.

The quantity of coal passing through the Sault Ste. Marie Canal thus far this season to October was 1,849,820 net tons, as compared with 2,206,142 net tons in 1893.

Coal is taken from Oswego by lakes and Welland Canal at 65c. to Duluth, 90c. to Chicago and 85c. to Milwaukee per net ton.

Heavy gales have been experienced by navigators on the lakes for several days, resulting in many losses of vessels and cargoes.

Duluth and Superior people are asking the Board of United States Army Engineers to recommend the government to spend \$2,500,000 for the improvement of the harbor at those ports, providing for 20 ft. of water and a 325 ft. entry, with stone piers and flaring mouth.

The consumption of coal in our city is being curtailed considerably by the addition of many new producing gas wells just outside our city limits. A new company is being formed to be known as the Seneca Gas Fuel Company.

**Chicago.** Oct. 10.

(From our Special Correspondent.)

The low price of anthracite coal and the continued cold weather have created a business during the past week far beyond the expectation of dealers here. Buying has really begun in earnest, and it is noticed that the sales are mostly for quantities greatly in excess of those that have been running for a long time past. Retailers generally have run throughout the past six months with a stock of anthracite greatly beyond their usual supply. The season has been an unusually dull one to them, but the cold and low prices have at last stirred up a very good trade. As predicted in my last report the railroads have reduced freight rates on bituminous coal from the Indiana fields. For a long time the Chicago & Eastern Illinois Railroad's freight rate from the Indiana-Brazil block coal fields has been \$1.10 per ton. The sales of this coal have fallen off greatly during the past year, and the producers

finally came to the conclusion that the railroad rates were at fault, as soft coal could be brought from West Virginia to Chicago at a rate not much in advance of the Indiana coal, and consumers appeared to favor the West Virginia material. Now the railroad has come to their aid and established a rate of 90 cents per ton, and so it is expected that Indiana block coal will sell for a reduced price this winter. The soft coal trade of Chicago during the past week has been quite heavy, an improvement having occurred in it fully equal to hard coal. It cannot be said, though, that the increased tonnage was due to manufacturers ordering large supplies; the real increase was from the retailers, who are now ordering their winter supplies in earnest. Prices are steady, though no present increase is probable. Shipments via lake and rail have fallen off, but should the present demand continue it is likely that they will again assume large proportions. Anthracite prices are \$4.75 for grate and \$5 for egg, stove and chestnut. For bituminous, prices are, f. o. b. Chicago: Youghiogheny, \$3.15; Raymond, \$3.50; Shawnee, \$2.50; Blossburg, \$3.90; New Kentucky, \$2.75; Hocking, \$2.90; Brazil Block, \$2.40; Birdseye Cannel, \$5.25.

Coke is now in good supply, with plenty of Connellsville coming in. Connellsville coke is selling at \$4@4.25; Pocahontas, \$3.75@4.

**Pittsburg.** Oct. 11.

(From Our Special Correspondent.)

Coal.—The market is unsettled; there is evidently dissatisfaction all around. The railroad coal operators of the Pittsburg district will, at the close of the lake trade, insist on an investigation of the condition of affairs. At the present they are too anxious to keep their mines in operation in order that they may reap all the benefits accruing from the trade now open. Yearly there is a lively scramble for lake contracts, and this season has been no exception to the rule. The boats with tows that left here in September failed to return and are laid up waiting for a rise. The stock of coal afloat between Natchez and New Orleans at various points amounts to 143 boats and 3 barges, as against 101 boats and 4 barges same time last year. The consumption for September was 28 boats and 1 barge. Prices of coal at Cincinnati are: Pittsburg and Kanawha 5 1/2 @ 6c. per bushel, float; delivered, \$4.50 per ton. Connellsville coke, delivered, \$2.50 per ton. One year ago Pittsburg coal was selling at \$3.25 per ton, 75c. above present price.

The district officers of the United Mine Workers in preparing their campaign for the maintenance of the scale rate of 60c. per ton, have arranged a series of meetings to cover every point in the district, beginning October 13th, at Moon Run. On October 16th a meeting will be held at West Newton; on October 17th, at Suterville; at Coulterville, October 18th; at Smithton, October 19th; at Banning, October 20th. Following these, meetings will be held every day until the district has been covered.

Connellsville Coke.—The market has quieted down to about its normal condition and is not showing as encouraging a condition. Production dropped back a few points for the first time since the ovens were fired up after the strike. The output was more than on the week previous; production showed an increase of about 1,800 tons, but too many ovens have been put in blast for the amount of coke consumed, and a curtailing of production follows. Several of the large plants have been reduced to the five-day plan of operating. The plants in all parts of the region have a full supply of water now, and the difficulty of obtaining cars is but slight. Should the number of furnaces go in blast that have been expected to start up, the coke trade will increase again. The Carnegie Steel Company, it is said, is willing to take all the surplus coke of the Frick Company until there is 10,000,000 tons of coke stacked up. Week's shipments: To Pittsburg, 2,078 cars; to points East, 1,454 cars; to points West, 4,108 cars; total, 7,640 cars. Circular prices are: Furnace coke, \$1; foundry coke, \$1.15; crushed coke, \$1.40, all on cars at ovens.

**IRON MARKET REVIEW.**

NEW YORK, Friday Evening, Oct. 12, 1894.

**Pig Iron Production and Furnaces in Blast.**

Fuel used.	Week ending				From Jan., '93.	From Jan., '94.
	Oct. 13, 1893.	Oct. 12, 1894.	Oct. 13, 1893.	Oct. 12, 1894.		
Anthracite.	35	15,458	31	17,401	1,200,204	657,741
Coke.	53	54,486	119	137,002	4,669,419	3,708,303
Charcoal.	28	5,670	22	4,745	336,844	166,495
Totals.	116	75,614	172	159,148	6,206,467	4,532,539

Pig Iron.—The pig iron market during the past week has proven disappointing to all who expected that the slight improvement noted a fortnight ago would continue. Some fair orders have come from consumers who must lay in their supplies before the close of navigation, but those who can get iron at any time continue to buy from hand-to-mouth. One or two large foundries report a good business in their products, but a number of smaller ones state that the trade is quiet, so that on the whole there is no appreciable improvement in the general demand. The production shows an increase over last month. Prices are weaker. In this market we find that the Southern iron agents have become more aggressively active than for two

or three months past. So far we do not hear of any very low figures, but prices are generally weaker, and there is no telling how they may go, unless the demand takes a turn for the better.

We quote this week: Northern brands, No. 1, \$12.50@13; No. 2, \$11@12.50; gray forge, \$10.50@11; Southern irons, No. 1, \$11.75@12.50; No. 2, \$10.75@11.50; No. 1, \$10.75@11.50; No. 2, soft F., \$10.25@11.

**Spiegelisen and Ferromanganese.**—No business is reported in either spiegel or ferro. Quotations are nominally: \$20.50@21 for 20% spiegel, and \$50.50@51 for 80% ferromanganese.

**Billets and Rods.**—No business of consequence is doing in billets or rods. Prices slightly weaker and quotations are nominally \$18.50@19.50; wire rods, domestic, \$25.50@26.50.

**Rails and Rail Fastenings.**—Only a small business is doing in standard sections. Quotations remain: Standard sections, \$24 at mill, \$24.80@25.50 at tide-water. In rail fastenings quotations are: Fish and angle plates, 1"20@1"40c. at mill; spikes, 1"50@1"75c.; bolts and square nuts, 2"2@2"25c.; hexagonal nuts, 2"10@2"30c. delivered.

**Structural Iron and Steel.**—During the past week a fair business has been done in structural material at unchanged prices. The mills also report an improvement in bridge work. Quotations are: Angles, 1"30@1"40c.; beams up to 15 in., 1"40@1"50c.; channels, 1"40@1"50c. on dock; tees, 1"50@1"60c. on dock.

**Merchant Steel.**—Manufacturers report a fair healthy demand for merchant steel. Prices, however, are absolutely without change. We quote: Tool steel, 5"65@6"25c.; tire steel, 1"50@1"60c.; toe calk, 1"70@1"90c.; Bessemer machinery, 1"25@1"40c.; open-hearth machinery, 1"85@2c.; open-hearth carriage spring, 1"70@1"90c.; crucible spring, 3"40@3"65c.; axles, scrap, 1"40@1"60c.; steel, 1"40@1"55c.; bars, common, 1"15@1"30c.; refined, 1"25@1"40c.; steel hoops, 1"45@1"60c. delivered; hooks and pins, 1"40@1"65c.; plates, flange, 1"60@1"80c.; firebox, 1"80@2"10c.; marine, 2"45@2"70c.; sheared, 1"80c.; shell, 1"40@1"60c.; tank, 1"30@1"40c.; universal mill, 1"25@1"40c.; all on dock.

**Old Material.**—Outside of a sale of a few hundred tons of old iron rails, no business was done in old material during the past week. Nominal quotations remain: Old steel rails, \$9.50@10; old iron tees, \$10@11 per ton; New York railroad scrap, \$11.50@12 per ton delivered at mill, and yard scrap at \$10; wrought turnings, delivered at mill, \$8@8.50; No. 1 wrought scrap at \$9.50@10.50 from yard, and machinery cast scrap \$9@10; old wrought tubes and pipe, \$6.50@7; old car wheel, \$9.50@10.50, New York; cast borings, \$6@6.50, delivered at mill.

**Birmingham, Ala.** Oct. 10.  
(From our Special Correspondent.)

No especially remarkable events have transpired in the iron market during the week. The large sales in the early part of September had a reactionary effect in creating a rather dull feeling during the last two weeks. This feeling has now worn off, and it is generally admitted that if no remarkably large sales have been made, sufficient small orders have come in to prevent any accumulation of stocks. All the furnaces ship more than their daily output, and stocks are on the decrease. The prices are still low, but no attention is paid to long time orders. Birmingham prices for pig-iron are as follows: Foundry No. 1, \$8@8.25; foundry No. 2, \$7.50; soft No. 1, \$7.50; soft No. 2, \$7.25; foundry No. 3, \$7; gray forge, \$6.50.

The tests made by the Sloss Iron and Steel Company with "Fortemolite" have been finished this week and a report on the same is now in the hands of the director. "Fortemolite" is the euphonic name for common pig iron subjected to a treatment under a patent owned by the Fortemolite Metal Company, of Chicago. The representatives of this company, Messrs. T. H. Moody and J. W. Miller, have been in the Birmingham district for several months experimenting with the iron from several furnaces. The Sloss Iron and Steel Company in taking this matter up concluded to make a series of tests to ascertain the true value of the claims made by the company. Iron from furnace No. 4 at North Birmingham was used, and the same tests were supplied to the treated and untreated metal taken from the same casts. The treatment consists in letting the iron run into heated chills coated with a wash consisting of carbonaceous material. So far as can be learned at present the results were satisfactory.

Work in the different machine shops is picking up again. Good sized contracts for sugar refining machinery and cotton compress work were taken by a Birmingham shop. Plate and sheet iron workers are especially busy as well as bridge builders. Three large bridges are under construction and a large number of tanks, stand-pipes and dry-kilns have been shipped by Birmingham makers. The Birmingham Rolling Mill has now nearly a complete force working. The puddle mill is running a triple shift and the bar and guide mills are on double turn.

The only material used in iron making in the Birmingham district, which is bought in the open market and for which correct quotations can be given, is at present limestone. All the iron ore used is mined by the furnace companies or furnished to the same by contractors from mines owned by the companies. Coke is supplied entirely by the

coke ovens, and even limestone is delivered to the furnaces from outside quarries, only in limited quantities, and is sold for 62 $\frac{1}{2}$ c. per ton, f. o. b. furnace. A deduction of 2 $\frac{1}{2}$ c per ton is made per unit, if the silica goes over 2 $\frac{1}{2}$ %, and a premium of the same amount is paid if the silica is lower than 2 $\frac{1}{2}$ %. This price is for crushed stone. Dolomite, which is delivered as broken stone, is sold at 60c. per ton f. o. b. Birmingham.

**Buffalo.** Oct. 11.  
(Special Report of Rogers, Brown & Co.)

The demand for foundry and mill iron does not increase, but seems to be maintained to the full capacity of furnaces to supply. No boom was looked for and no boom has come, but there is a very fair business going. It is well distributed as to territory and varieties of iron called for. We quote for cash f. o. b. cars Buffalo: No. 1 foundry strong coke iron Lake Superior ore, \$11.75; No. 2 foundry strong coke iron Lake Superior ore, \$11.25; Ohio strong softener No. 1, \$12.25; Ohio strong softener No. 2, \$11.25; Jackson County silvery No. 1, \$15.75@16.75; Lake Superior charcoal, \$14.50; Tennessee charcoal, \$15.50; Southern soft No. 1, \$11.75; Southern soft No. 2, \$11.50; Hanging Rock charcoal, \$18.50.

**Chicago.** Oct. 10.  
(From our Special Correspondent.)

There has been no change of importance in the condition of the Chicago iron market with the first week of October. Mining machinery manufacturers in this vicinity report business particularly good in gold-milling plants. Fraser & Chalmers are said to have several hundred thousand dollars' worth of contracts on hand at the present time, but the main part of them is for city railroad work.

**Pig Iron.**—The aggregate of pig iron sales will equal those of the previous week, but it is noticed that the actual number of orders exceeds last week. This is from the fact that the sales of the week have been mainly for small quantities, the largest one observed being one of 500 tons against one of 2,000 tons of the previous week. Prices of Northern iron remain as per last report, though a concerted effort on the part of the local furnaces would raise them 25c. or 50c. per ton. There is some talk of No. 2 iron being sold at \$9.25 Chicago, but there is nothing to substantiate such assertions. A carload of white iron was recently sold at \$9.25, but the company that made the sale was anxious to get rid of the iron, not caring to work it again. Southern iron sales are few, the prices on that material being so high that competition with the Northern iron is impossible. Prices are per gross ton f. o. b. Chicago: Lake Superior charcoal, \$14.75@15.25; Lake Superior coke No. 1, \$10.25@10.50; No. 2, \$10@10.25; No. 3, \$9.50@9.75; Jackson County silveries, \$14.50@15; Southern coke, foundry No. 1, \$11.25@11.50; No. 2, \$10.75@11; No. 3, \$10.25@10.50; Southern coke, soft, No. 1, \$10.75@11; No. 2, \$10.50@10.75; Southern car-wheel iron, \$17.50@18; Southern silveries No. 1, \$11.50@12; No. 2, \$11.50@12; Tennessee charcoal No. 2, \$14@14.50. Bessemer, \$11.25@11.50; Ohio strong softeners, \$13@13.50.

**Structural Material.**—Contracts for bridgework are coming in freely. There is a considerable amount of such work in Chicago and vicinity at the present time, and the track elevation insures good business for the future. The Lake Street Elevated road began this week its extension through Lake street to Wabash avenue. Quotations are f. o. b. Chicago: Angles, 1"45@1"50c.; tees, 1"50@1"60c.; universal plates, 1"50@1"55c.; beams and channels, 1"50@1"60c.

**Plates.**—The demand for plates for boiler and other lines holds very well. The tonnage of September far surpassed that of September, 1893. The outlook is very good. Prices are: Flange steel, 1"65@1"75c.; fire-box steel, 3"50@4"50c.; tank steel, 1"40@1"50c.; boiler tubes, 70 to 75% discount.

**Merchant Steel.**—Business, particularly in the implement line, is exceedingly good, and the total sales of the week are beyond that of last, and much beyond those of the same week in 1893. Prices are, carload lots: Smooth finished machinery, 1"75@1"90c.; tire steel, 1"70@1"80c.; Bessemer bars, 1"40@1"50c.; toe calks, 2"10@2"20c.; crucible spring, 3"40@3"65c.; tool steel, 6 $\frac{1}{2}$ c. and upward; specials, 12@20c.

**Galvanized Sheet Iron.**—There is no change noticeable in galvanized sheet. The mills are endeavoring to force up prices, but so far have not succeeded. Quotations are yet 7 $\frac{1}{2}$ , 10 and 5% off.

**Black Sheet Iron.**—The buying of black sheet is still limited to sales of small quantities, though the aggregate shows up well. No. 27 remains 2 $\frac{3}{8}$ c. from mill.

**Bar Iron.**—Freight rates having been reduced bar iron is now quoted 1"05@1"10c. for Chicago. The business of the week has not been satisfactory.

**Billets.**—An exceptionally good week has passed in billets. The steel company reports being sold up to end of year in both billets and rods. The week must have furnished a great run of orders, as the last report a week ago made the company only sold up to end of October. Billet price is \$17.50@18 and steel rods \$24.50@25.

**Steel Rails.**—The orders booked for rails during the week foot up a tonnage larger than any other week for some time. There is a good demand for the lighter class of rails for electric railroads in this and other cities. Price is \$25@27, according to specification.

**Old Rails and Wheels.**—A few sales of small quantities of old iron rails at \$11 are observed, while

old steel rails are meeting with a considerable inquiry at \$7.50@10 according to length.

**Scrap.**—But few sales are being made, and but little attention is being paid scrap. Quotations are: Forge \$8.50@9; cast iron borings, \$3.50@4; wrought iron turnings, \$4@4.50; axle turnings, \$6@6.50; mixed steel, \$5@5.50; tires, \$12.50@13; iron axes, \$13.

**Pittsburg.** Oct. 11.  
(From our Special Correspondent.)

**Raw Iron and Steel.**—There is practically little change to note in the condition of the market for iron and steel. A cause of disturbance, however, exists in the indisposition of consumers to do much until the November elections are over, and another unsettling factor is the approaching termination of the steel railmakers' agreement which has not yet been renewed; when these two matters are adjusted an improvement in trade is expected. The steadiness a short time ago in certain leading centers continues, but in the local market the conditions are neither better nor worse than at the date of our last report. The volume of business is larger than it was a few months ago, and the demand is larger and prices better than they were one year ago; nevertheless, the trade is not what it should be at this season of the year. Most of the mills have work in hand to keep them busy for a few months. Notwithstanding the large production of pig iron the demand seems to have been sufficient to prevent any accumulation of iron in first hands; many furnaces have orders ahead to take the larger part of their output during the remainder of the year, but there seems to be a sufficient supply to enable orders for quick delivery to be filled with ease. There is little expectation of an appreciable increase in the demand during the present month, but there seems to be sufficient activity to take care of the output at the present rate of production. The trade, the balance of the year, gives promise of a moderate expansion, but with prices irregular, buyers show a disposition to continue their policy of purchasing only to meet present wants. In the Wheeling district every furnace but one is in operation making Bessemer pig, and that one is making preparations to start. The Valley mills are making full time with many orders yet unfilled. In the Pittsburg district there are over 150 furnaces in blast with several running double turn. Finished material orders are not quite as plentiful as they have been, but there appears to be sufficient to keep mills going from day to day. Prices show no change.

COKE SMELTED LAKE AND NATIVE ORE.		SKELP IRON.	
Tons.	Cash.		
6,000 Bessemer, Oct.	\$11.15	700 Sheared iron, 1"32 4 m.	
4,000 Bessemer, Oct.	10.90	500 Wide gr'vd., 1"20 4 m.	
4,000 Bessemer, Oct.	11.10	450 Nar. gr'vd., 1"20 4 m.	
3,000 Bessemer, Valley Furnace, Oct.	10.25	SKELP STEEL.	
3,000 Bessemer, Oct.	11.00	1,000 Sheared steel, 1"20 4 m.	
2,000 Bessemer, Oct.	11.00	300 Wide gr'vd., 1"05 4 m.	
2,000 Bessemer, Valley Furnace, Oct.	11.25	500 Nar'w gr'vd., 1"05 4 m.	
1,000 Bessemer, Oct.	10.25	MUCK BAR.	
1,000 Bessemer, Oct.	11.00	600 Neutral, delivered, Oct.	19.00
1,000 Bessemer, Oct.	11.00	BLOOMS, BILLETS, BAR ENDS.	
1,000 Bessemer, Oct.	11.00	500 Blooms and bar ends, delivered	11.25
1,000 Gray Forge	9.90	FERRO-MANGANESE.	
500 Mill, Spot	10.15	100 80%, delivered	50.60
5 0 Bessemer, Oct.	11.25	50 80%, foreign	51.25
300 Off Bessemer	10.25	SHEET BARS.	
300 No. 2 Foundry	11.25	320 Delivered	22.50
250 No. 2 Foundry	11.25	SPELTER.	
250 No. 1 Foundry	12.00	100 Spelter	3.40
100 No. 1 Silvery	14.00	50 "	3.35
CHARCOAL.		STEEL WIRE RODS.	
150 Warm Blast	16.75	650 5-gauge American	23.25
100 No. 2 Foundry	16.80	OLD RAILS.	
100 Cold Blast	23.50	350 Steel rails	9.75
50 No. 2 Foundry	16.80	200 Steel rails	10.50
25 Warm Blast	16.60	200 Iron rails	12.00
BLOOMS, BILLETS AND SLABS.		SCRAP MATERIAL.	
5,000 Billets, Oct., Nov., at mill	\$16.85	450 No. 1 cast scrap, gross	9.00
3,000 Billets and slabs, Oct., at mill	17.15	300 Old car wheels, gross	10.00
3,000 Billets, Oct., Nov., at mill	17.00	300 No. 1 wrought, net	10.00
1,000 Billets, Oct., at mill	17.00	100 Wrought turnings, gross	8.00
1,000 Billets, Oct., Nov., at mill	16.50		
1,000 Billets, Oct., Nov., at mill	16.40		

**Philadelphia.** Oct. 12.

(From our Special Correspondent.)

**Pig Iron.**—Less business was done this week. The fact that there is an increased activity in Eastern bar mills is given as a reason why big sales are looked for in forge iron. Foundry work comes in slowly, and No. 1 is weak at \$12.50, No. 2 is held at \$11.50, but no large sales. Bessemer is weak at \$13.

**Muck Bars.**—Small sales are reported at \$19.

**Billets.**—As soon as billets can be had at \$18 there will be large orders placed for winter delivery.

**Merchant Iron.**—Some mills have picked up considerable business, and there is a better feeling. Common iron, 1@1"10; medium, 1"15.

**Skelp.**—Our skelp mills manage to keep pretty well supplied with business. Some more big work is promised for November. Grooved is 1"25.

**Sheet.**—The sheet mills are all running full time. Prices for early winter delivery are a shade lower.

**Merchant Steel.**—Mills are not crowded. The distribution is somewhat fluctuating.

Wrought Pipe.—The last few days opened up some orders of fair size.

Plate Tank.—Specifications received Monday have been figured on a basis of 1-25 for steel. Prices are low, when a big order is under consideration. On small orders for quick delivery there are stronger prices.

Structural Material.—Inquiries in sight will cover 2,000 tons, and the orders are to be placed next week. Our agents have sent in their best bids on some of these orders. Looks as more would be made. Beams are nominally 1-30. Universal mill plate, 1-25; angles, 1-40; channels, 1-35. There is very little encouragement in sight. Some brokers claim inside information of the intention to place large orders for structural iron in November.

Steel Rails.—Standard sections, \$24. Brokers who are posted say that large orders for repairing purposes will be placed during November and December, but at the rail-mill offices. Girders continue active.

Old Rails.—Quiet at \$12.

Scrap.—Scrap that can be used in mills is fairly active.

METAL MARKET.

NEW YORK, Friday Evening, Oct 12, 1894.

Gold and Silver.

Prices of Silver per Ounce Troy.

Table with columns: October, St. Ex., London Pence, N. Y. Cts., Value of silver in \$., and corresponding values for 1890-91, 1891-92, 1892-93, 1893-94.

The silver market has presented no new features the past week. Consumption keeps pace with production. It is an open question whether, in case of a settlement of Eastern difficulties, silver will recede to a lower level. The demand for China and Japan for war purposes has furnished a market for considerable bullion; whether the commercial expansion after peace is declared will require an additional quantity is an interesting question.

The United States Assay Office at New York reports the total receipts of silver at 173,000 oz. for the week.

Gold and Silver Exports and Imports.

At all United States Ports, August, 1891, and Eight Months, 1894 and 1893.

Table comparing Gold and Silver Exports and Imports for August 1894 and 1893, including total excess or import.

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

Gold and Silver Exports and Imports, New York

For the week ending October 6th, 1891, and for Years from January 1st, 1891, 1893 and 1892.

Table comparing Gold and Silver Exports and Imports for New York, showing weekly and yearly data.

Imports of gold for the week were from the West Indies; of silver from Central America. The exports, both of gold and silver, went to London.

During the five days ending October 12th the imports and exports of gold and silver from the port of New York were as follows: Imports, gold, \$211,210; silver, \$25,492. Exports, gold, none; silver, \$704,602. Of the silver exported, \$16,000 was in Mexican coin and went to London. The remainder was in American coin and bullion, all of which went to London.

FINANCIAL NOTES OF THE WEEK.

Our reports continue to be generally of a favorable character and indicate that there is no check to the steady increase in the volume of trade. The blast furnace reports show an increase of production and a decrease in unsold stocks, and in other branches, of business there is a continued gain. The railroad reports show improvements, and the trunk lines' weekly statement gives a notable increase in west-bound freight, that is in shipments of manufactured goods to the Western markets. While no great changes can be expected from week to week, the present moderate and healthy improvement promises well for the future.

The continued shipments of gold from London to Germany and Holland and the proposed Austrian gold loan have caused some talk here of further gold shipments from New York. None have been made, however, and none are likely to be made unless there is a rise in the rates of exchange. At the present quotations gold cannot be shipped at a profit, and there is no immediate prospect of a rise. The facts seem to be that the heavy loans of last

fall have been pretty generally paid back. The selling back of American securities has been stopped in view of rising prices on the European exchanges, and for the present the balance is in our favor. The demand for gold is not greater than can be readily supplied from London, even if it should continue for some weeks.

In some quarters it has been said that gold shipments at this season of the year would be altogether without precedent, the impression sought to be conveyed being evidently that any shipments now would form a most unfavorable symptom of the situation. By reference to the Treasury reports we find that in 1891 the gold exports made in the last quarter of the year—October, November and December—amounted to \$1,446,045, comparatively a small sum, it is true; in 1892 they were \$14,502,624, and in 1893 the amount was \$2,897,406. It is true that large exports at this season are the exception; but any made now would simply show that a chance existed for securing higher interest for the time in Germany than here. But none has been made as yet.

It will be of interest here to give the corrected statement of gold exports and imports for the fiscal years ending June 30th as follows:

Table showing Exports, Imports, and Ex. exp. for fiscal years 1890-91, 1891-92, 1892-93, and 1893-94.

The year 1891-92 was an exceptional one, owing to the great wheat crops here, coupled with short supplies in Europe. Last year, 1893-94, was again exceptional, the imports being increased by the heavy loans made in the panic season.

Silver exports and imports for the same years were as follows:

Table showing Exports, Imports, and Excess exp. for silver in fiscal years 1890-91, 1891-92, 1892-93, and 1893-94.

The continued large increase in our silver exports is shown clearly by this statement.

The Bureau of Statistics, Treasury Department, gives the exports and imports of gold and silver in ores as follows for the eight months ending August 31st:

Table showing Imports in ore for 1893 and 1894, including Gold and Silver.

Total Exports in ore for 1893 and 1894.

Gold and silver are not separated in the statement of exports, the amount of which is small.

The corrected statement of the Bureau of Statistics, Treasury Department, gives the merchandise exports and imports of the United States for the eight months ending August 31st as below:

Table showing Exports and Imports for 1892, 1893, and 1894.

Exports include domestic merchandise only. The value of foreign merchandise re-exported this year was \$13,540,630.

The statement of the New York banks for the week ending October 6th shows decreases of \$1,340,825 in reserve and \$18,500 in "gal tenders"; increases of \$2,907,900 in deposits, \$2,716,200 in loans, \$264,600 in specie, and \$338,200 in circulation. The total reserve was \$206,836,000, being \$59,450,959 above the legal limit. The continued expansion of loans and discounts is a sign of increasing business everywhere and a resulting demand for money.

The statement of the United States Treasury on Thursday, October 11th, shows balances in excess of outstanding certificates as below, comparison being made with the corresponding day of last week:

Table comparing Gold, Silver, Legal tenders, and Treasury notes, etc. for Oct. 4 and Oct. 11, 1894.

Total government deposits with national banks on same date amounted to \$11,111,684, an increase of \$385,463 during the week.

The Director of the Mint now believes that the gold output of the United States for 1894 will reach at least \$43,000,000. This estimate is based on the returns from the branch mints and assay offices and on other reports received and on the estimate made by the "Engineering and Mining Journal" at the commencement of the year.

The coinage at the San Francisco Mint in September amounted to \$1,640,000 in double-eagles, \$279,500 in half-eagles and \$300,000 in silver dollars. The total coinage was therefore 137,900 gold pieces of a value of \$1,919,500, and 3,000 silver pieces. For the three months of the fiscal year, from July 1st to September 30th, the coinage was \$3,900,000 in double-eagles, \$279,500 in half-eagles, \$760,000 in silver dollars and \$248,000 in half-dollars.

The Bank of France on Thursday, October 11th, reported its specie holdings at 1,895,767,000 fr. gold and 1,244,630,000 fr. silver; an increase of 204,920,285 fr. gold and a decrease of 21,665,425 fr. silver as compared with the corresponding date last year. Changes during the week were decreases of 5,125,000 fr. gold and 9,425,000 fr. silver.

The Bank of England on Thursday, October 11th, reported its total gold holdings at £36,843,717, an increase of £10,393,868, as compared with the corresponding date last year. The bank has lost a considerable amount of gold; and its proportion of reserve to liabilities is 61.7% against 68.1% last year. This proportion is lower than for several months past, though still high; it was 45.7% a year ago.

The Imperial Bank of Germany on Wednesday, October 10th, reported its total specie holdings, gold and silver, at 909,080,000 marks, an increase of 120,940,000 marks over the corresponding date last year. The bank does not report gold and silver separately. Changes during the week were a decrease of 10,000,000 marks.

Specie holdings of other European banks on Thursday, October 11th, are reported by cable to the "Journal of Commerce" as below:

Table showing Gold, Silver, and Total specie holdings for Austro-Hungarian, Netherlands, Belgian National, and Bank of Spain.

The Belgian National Bank does not report gold and silver separately. No report is received from the Imperial Bank of Russia.

The issues of new securities in London for the nine months ending September 30th amounted in all to £49,212,000, against £34,900,000 for the corresponding period last year; £66,792,000 in 1892; £72,293,000 in 1891, and £128,856,000 in 1890. The increase this year over last has been mainly in the quarter just closed, and has been due chiefly to large issues of Indian government and English municipal loans.

Exports of silver from London to the East for the year up to September 28th are given by Messrs. Pixley & Abell's circular as below:

Table showing Exports of silver to India, China, and The Straits for 1893 and 1894, including changes.

The heavy shipments to China so far have more than made up the decrease to those to India. The Straits shipments show but little change.

The fall in Indian exchange has stimulated gold selling in that country again, and the gold buyers are further helped by the ease in money. The rates of discount announced this week are 3% in Calcutta and 4% in Bombay, against the 9% and 10% rates which prevailed earlier in the year. Gold shipments from India, which were very small last month are likely to show a considerable increase in October.

The annual meeting of the American Bankers' Association opened in Baltimore on Wednesday of this week with a large attendance, some 600 delegates being present. After the usual addresses of welcome from Mayor Latrobe and others, Mr. M. M. White, president of the association, delivered his annual address, the burden of which was the necessity of a sound currency, and the pressing obligation of reforming and consolidating our present system. The annual report of the executive committee laid considerable stress on the same point; among its minor suggestions was one to improve the provisions for protecting the banks against fraud. Some minor improvements to the constitution were proposed, and the secretary reported that the present membership was 1,742. Mr. Myron H.errick, of Cleveland, O., read a paper on the "Influence of the Newspaper Press on Finance," giving much credit to the press, but at the same time severely criticizing the sensational methods adopted by certain papers. Other papers and addresses at the first day's meeting were on the "Responsibility of Bankers to the General Public," by Mr. D. B. Rieger of Kansas City; on "Profit and Loss in Bank Account," by Mr. James G. Cannon, of New York; on the "Ethics of Banking," by Mr. E. C. Bohne, of Louisville, Ky., and on the "Variation in State Law Governing Commercial Paper," by Mr. Thos. P. Patton, of New York.

At Thursday's meeting an important paper on "Proposed Amendments to the National Banking Act, Prepared under the Supervision of the Baltimore Clearing House," was presented. The chief feature of the proposed amendments was the repeal of the provision of the present act requiring the deposit of bonds to secure circulation, and in its place provision permitting the banks to issue notes to the amount of 50% of their capital stock, subject to a tax of 0.5% yearly to defray the expenses of printing, etc., and the deposit of a redemption fund equal to 5% of the circulation, and of a guarantee fund of 2% on the circulation, the last named fund to be used to redeem the notes of insolvent banks. The plan has been carefully worked out, with a view of providing greater elasticity in currency than is possible under the present system, and was submitted to the association for the purpose of calling out discussion. A. B. Hepburn, ex-comptroller of the currency, made an address upon the subject, saying, the substance of the cur-

rency plan presented by the bankers of Baltimore is this: 1. A currency to serve public and private needs must be national. 2. A perfectly safe currency can be provided without stocks or bonds as security. 3. No currency can be elastic that is secured by bonds, since the cost of the bonds exceeds the amount of currency that can issue. 4. The experience of the Dominion of Canada, and the statistical history of the national banking system, during a period of 31 years in this country, show conclusively that the first lien upon a failed bank's assets, including stockholders' liability, together with a moderate safety fund, affords ample protection to bill-holders. Mr. Hepburn enlarged upon the subject at considerable length, and in conclusion moved the adoption of a resolution indorsing the principles of the proposed plan. Comptroller of the Currency Eckels then made a brief address following the same general lines in favor of currency legislation. Other addresses were made by Capt. R. J. Lowry, of Atlanta, Ga., and Mr. George L. Christian, of Virginia. A brief discussion of the plan followed in which bankers from all parts of the country participated, the speeches being limited to five minutes. At the conclusion of this discussion Mr. Hepburn's resolution indorsing the plan was carried by all but a single vote, and the following committee of nine was appointed to present it to Congress: C. C. Homer, Baltimore; A. B. Hepburn, New York; Charles Parsons, St. Louis; Skipwith Wilmer, Baltimore; G. L. Christian, Richmond; J. C. Hendrix, New York; Horace White, New York; R. J. Lowry, Atlanta, and W. T. Baker, Chicago.

The election of officers resulted as follows: President, J. P. Odell, Chicago; first vice-president, Douglas H. Thomas, of Baltimore; E. H. Pullen, of New York, chairman; and Henry W. Ford, of New York, secretary of the Executive Council. There were also named the following members of the Executive Council for three years: Myron T. Herrick, Cleveland; Herman Justi, Nashville; Thomas P. Beale, Boston; Henry W. Yates, Omaha, H. W. Wheeler, Seattle; J. Edward Simmons, New York; W. C. Cornwell, Buffalo.

The meeting concluded on Thursday evening with a dinner given to the members of the association by the Baltimore bankers.

**Domestic and Foreign Coins.**

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

	Bid.	Asked.
Mexican dollars.....	\$1.14	52
Peruvian soles and Chilean pesos.....	.50	.52
Victoria sovereigns.....	4.84	4.88
Twenty francs.....	3.84	3.88
Twenty marks.....	4.74	4.80
Spanish 25 pesetas.....	4.78	4.83

**Other Metals.**

**Copper.**—The volume of business done this week has not been large, although quite satisfactory, all things considered. More could probably have been done if holders had shown a willingness to accept less, but, aside from secondhands, who have but little to offer, all have firmly held out for at least 9% for Lake, for which some ask 10c.; 9% for Electrolytic and 9.20 to 9.30 for Casting copper.

In the London speculative market prices have fluctuated constantly this week, having opened on Monday at £41 12s. 6d. for spot and £42 for futures, declining 5s. on Tuesday and the same amount on Wednesday, advancing the following day 2s. 6d., and closing to-day at £41 2s. 6d. for spot and £41 10s. for futures. The transactions have been quite numerous in this description of copper, but the demand for refined and manufactured sorts is slack at prices noted below: English tough, £44@£44 5s.; best selected, £44 5s.@£44 15s.; strong sheets, £52; India sheets, £48; yellow metal, 4 3/4d.

Imports of copper in Great Britain for the eight months ending August 31st were 77,283 long tons, an increase of 2,820 tons over last year. Exports were 37,279 tons, a decrease of 13,741 tons from last year.

Shipments from the west coast of South America for the eight months to August 31st are given by Messrs. Richardson & Co.'s circular in tons of fine copper at 14,350 tons, against 13,650 tons in 1893, and 15,050 tons in 1892.

**Copper Exports.**—The exports of copper from the port of New York during the week ending October 12th, as reported by the New York Metal Exchange were as follows:

London—America.....	Pigs	100 tons
Glasgow—Anchuria.....	Ingots	10 "
Liverpool—Cevic.....	Pigs	188 "
Antwerp—Noordland.....	Plates	20 "
Rotterdam—Werkendam.....	Plates	80 "
" " " " " "	Ingots	45 "
" " " " " "	Pigs	25 "
" " " " " "	Bars	30 "
Liverpool—Lucania.....	Pigs	50 "
Havre—La Bretagne.....	Ingots	80 "
" " " " " "	Plates	37 "
Bordeaux—Panama.....	Bars	150 "
Rotterdam—Maasdam.....	Bars	100 "
" " " " " "	Ingots	50 "
" " " " " "	Plates	51 "
Swansea—Kansas City.....	Bars	200 "

Exports of metals (other than copper) from the port of New York for the week ending October 4th are reported by the New York Metal Exchange as follows: 804 tons of old iron rails to Genoa; 81 tons tin scrap to Antwerp; 30 tons tin scrap to Rotterdam; 28 tons zinc skimmings to Bristol; 160 tons old iron axles to Glasgow; 3 tons old metal to Rotterdam.

Imports of metals into the port of New York for the week ending October 4th are reported by the

New York Metal Exchange as follows: 175 tons tin from Singapore; 350 tons tin from London; 150 tons Straits tin from Holland; 200 tons lead, duty paid, from Marseilles; 200 tons lead, duty paid, from London; 1,016 tons lead, duty paid, from Antwerp; 345 tons copper matte from Mexico; 50 casks antimony from London; 50 casks of antimony from Liverpool; 100 casks antimony from Newcastle.

The imports reported at Philadelphia during the past week include 3,400 tons of iron ore from Cuba and 3,720 tons of manganese ore from Asiatic Russia.

Exports of copper from Baltimore for the week ending October 11th are reported by our special correspondent as follows:

Bremen—Weser.....	278 bars	44 835 lbs.
Rotterdam—Govino.....	6,910 ingots	112 090 "
Hamburg—Grimm.....	45 cakes	157,323 "
" " " " " "	2,143 ingots	25,000 "
Antwerp—Rialto.....	2,726 bars	349 622 "
" " " " " "	2,132 ingots	25,000 "

Other metals exported during the week were: 857 bundles scrap tin, 215,395 lbs., to Rotterdam; quantity scrap tin, 12,000 lbs. to Liverpool; 41 barrels zinc dross, 24,099 lbs., to London; quantity scrap tin, 56,800 lbs., to Antwerp.

**Tin.**—The scarcity of metal available for immediate delivery has practically continued throughout this week, and as much as 15.80 has been paid for it by dealers who, in turn, were sellers of forward deliveries at half a cent a pound less. This state of affairs is naturally conducive to limited buying, on the part of consumers, of prompt deliveries, but the very low prices quoted for futures attract more or less attention. At the close we have to quote spot as 15.75, November 15.50 and December as 15.40.

The London market opened weak at £1 sterling below the close of last week, but on Tuesday afternoon advanced 2s. 6d. On Wednesday afternoon there was another advance, that time of 7s. 6d., while on Thursday morning spot was quoted 7s. 6d. higher still, and futures 10s. better than the day before. This morning, however, there has been a slight reaction, while the close is at £70 for spot and £70 7s. 6d. for three months prompt.

**Lead.**—As the Western producers have not only continued their efforts to sell their product, but have almost doubled them, buyers have been still further frightened, causing a very noticeable contraction in the volume of business. Although we still quote 3.15 to 3.20, some might, with justice, call it 3 3/4 flat.

The foreign markets have done just the reverse, as Spanish lead is now quoted at £9 18s. 9d. in London, where English lead commands 2s. 6d. more per ton.

**St. Louis Lead Market.**—The John Wahl Commission Company telegraphs us as follows: Lead presents no novelty. The latest sales are on basis 2.92 3/4c., East St. Louis, for soft Missouri and argenterous brands. Neither buyers nor sellers are making any strenuous efforts to trade.

**Spelter.**—Producers seem disposed to be a little firmer in their views, and to ask slightly higher prices, but the only effect their action can have will be that of causing buyers to hold aloof, as the latter cannot afford to pay more than the figures recently quoted, which have now to be changed to 3.45@3.50, New York, for shipment from the West.

The London market is lower and there good ordinary brands are obtainable at £15 3s. 9d. (as against £15 7s. 6d. quoted a week ago, specials commanding the usual 2s. 6d. extra.

**Antimony** is in fair demand at 9 1/2 for Cookson's; 8 1/2 for L. X.; 7 1/2 for Hallett's; 9 1/2 for U. S. French Star.

**Quicksilver.**—Nothing of interest is doing in this market, and quotations remain unchanged from last week at \$37 for New York, and \$26 14s. @£6 15s. the latter being Rothschild's price.

**Aluminum.**—Current quotations are unchanged as follows, No. 1 being over 98% pure metal, and No. 2 over 94% pure: No. 1 in rolling ingots, 63c. per lb. for small lots at factory; 60c. in 100 lb. lots; 58c. in ton lots. No. 1 in ingots for remelting, 60c. for small lots, 55c. for 100 lb. lots, and 53c. in ton lots. No. 2 in ingots for remelting, 55c., 53c. and 50c. per lb., according to size of order. Sheets, 80c. @ \$4.40 per lb., according to size and thickness. Wire, \$1 @ \$2.50 per lb., according to gauge. Castings, 90c. per lb. up, according to number, weight, patterns, etc. Tubes, from 20c. to \$3.15 per foot, according to thickness and diameter.

Abroad quotations for 99% pure metal in Paris are 5.75@7.75 fr. per kilo. for ingots; 7.50@11.50 fr. for sheets; 10@17.50 fr. for wire, and 16@22 fr. for tubes. The Neuhausen Company quotes No. 1 (guaranteed 98% pure, and in fact 99.75%) at 5 fr. per kilo, for ingots in small lots; for large lots a considerable discount is allowed. This price is at the works in Switzerland.

**Bismuth.**—Recent quotations on the New York Metal Exchange are \$2 per lb. for lots of 500 lbs. or over; \$2.25 @ \$2.50 per lb. for smaller lots.

**Magnesium.**—No quotations are to be found for this metal in New York, where sales are seldom made. Prices in Germany are, for lots of over 10 kilos: Ingots, \$6.75 per kilo; bars, \$6.50; powder, \$9; ribbon and wire, \$9.50. For orders of less than 10 kilos., 25 cents per kilo, must be added for ingots or bars, and 50 cents for ribbon, wire or powder. These prices are delivered at works; the Aluminum und Magnesium Fabrik, Hemelingen, Germany, is the only maker of the metal in commercial quantities.

**Nickel.**—Quotations are nominally 40@44c. per lb., according to grade. Business is dull, and some sales have been made below these figures, say 38 1/2 @42c. Abroad the demand has also been light, and prices have a downward tendency.

**Platinum.**—Abroad the prices are firm, with no recent change.

For chemical ware, hammered metal, Messrs. Eimer & Amend, New York, quote crucibles and dishes 41c. per gram for orders of over 250 grams; 43c. for orders of 100 grams or over, and 45c. for small lots. Wire and foil are 40c., 41c. and 42c. per gram, respectively, for orders of the quantities named. Current retail prices for crucibles are 50c. per gram.

**Phosphorus.**—Quotations continue steady at 50 @52 1/2c. per lb., f. o. b. New York or Philadelphia.

**Sodium.**—In England and Germany makers quote 90@95c. per lb. Sales in this market are too small to furnish quotations.

**CHEMICALS AND MINERALS.**

**NEW YORK, Friday Evening, Oct. 12.**

**Heavy Chemicals.**—We must continue to report a quiet chemical market. The glass trade is commencing to improve slowly, and as this takes place the demand for alkali and carbonated soda ash grows better. Thus far both of these chemicals have been quiet. Not much is doing in caustic soda. Contracts for delivery next year have been nearly all placed and only a jobbing trade is reported. Bleaching powder on the spot has been in rather better demand. Sal soda is quiet and featureless.

Spot quotations are as follows: Caustic soda, 60%, 2.35@2.40c.; 70%, 2.17 1/2c.; 74%, 2.20c.; 76%, 2.27 1/2c. Carbonated soda ash, 48%, .95@1c.; 58%, .87 1/2@90c. Alkali, 48%, .95@1c.; 58%, .87 1/2@90c. Bleaching powder, English, 1.75@1.80c.; German, French or Belgian, 1.50@1.62 1/2. Sal soda, .72 1/2@75c.

**Acids.**—Makers report a better jobbing demand for acids, owing to the improvement in business among consumers. It is yet too early for contracts for 1895 delivery to be placed, but the prospects are good for a fair business. Prices are unchanged and we quote: Acids, per 100 lbs. in New York and vicinity, in lots of 50 barrels or more: Acetic, in barrels, \$1.40@£1.60; muriatic, 18", 80c.@\$1; 20", 90c.@\$1.10; 22", \$1@£1.25; nitric, 40", \$4; 42", \$4.50@£4.75; sulphuric, 75c.@\$1; chamber acid, \$6 per ton. Mixed acids according to mixture, oxalic, \$6.50@£7.50 per 100 lbs. Blue vitriol is quoted at \$3.50@£3.62 1/2; glycerine for nitroglycerine, 11 1/2@12 1/2c., according to quality and quantity.

**Brimstone.**—The market for Sicilian brimstone continues quiet. Only a jobbing trade is doing. Quotation are: On the spot, best unmix second, \$16; best thirds, \$15. Shipments, best unmix second, \$15.50; thirds, \$1 less.

**Fertilizing Chemicals.**—The fertilizer market has been very quiet this week. Sellers are firm in their prices, in consequence of which what few buyers there are, are holding off in hope of a decline. Only a few sales were made during the week. Quotations are as follows: Sulphate of ammonia gas liquor, \$3.60@£3.65; bone, \$3.50@£3.55. Dried blood, high grade, \$2.45@£2.50; low grade, \$2.35@£2.40. Azotine, \$2.40@£2.45. Concentrated phosphate (30% available phosphoric acid), 75c. per unit. Acid phosphate, 13% to 15%, av. P.2O.5, 60c. per unit at seller's works in bulk. Dissolved boneblack, 17% to 18%, P.2O.5, 90c. per unit. Acidulated fish scrap, \$14@£15, and dried scrap nominally \$25 f. o. b. fish factory. Tankage, high grade, \$23@24; low grade, \$22@£22.50. Bone tankage, \$22.50; bone meal, \$24@£25.50.

In lots of 50 tons on contracts we quote: Double manure salts, 48-53% (basis of 48%): New York and Boston, \$1.12; Philadelphia, \$1.14 1/2; Charleston, Savannah, Wilmington, N. C., and New Orleans, \$1.17. High grade manure salts, 90-95% and 96-99% (basis 90%), respectively: New York and Boston, \$2.07@£2.11; Philadelphia, \$2.09 1/2@£2.13 1/2; Charleston, Savannah, Wilmington, N. C., and New Orleans, \$2.12@£2.16.

**Phosphate Rock.**—Quotations at Charleston, S. C., are: \$4@4.25 for standard land, kiln dried rock; ground rock, in buyer's bags \$5.50@£5.60, in seller's bags \$1 higher. Acid phosphate remains at \$6.25@£6.50.

**Muriate of Potash.**—Arrivals during the week were about 200 tons, all of which went into immediate consumption. In lots of 50 tons, quotations are as follows: 80-85% and minimum 95% (basis 80%), respectively: New York and Boston, \$1.78@£1.91; Philadelphia, \$1.80 1/2@£1.83 1/2; Charleston, Savannah, Wilmington, N. C., and New Orleans, \$1.83 1/2@£1.80.

**Kainit.**—Prices for kainit (minimum 23%) in carzo lots for 1894 delivery are as follows for invoice and actual weights respectively: New York, Boston and Philadelphia, \$9@£9.25; Charleston, Savannah, Wilmington, N. C., and New Orleans, \$9.75@£10. For sylvinite, 27-35%, prices are as follows, per cent. per gross ton, invoice weight: New York, Boston and Philadelphia, 37 1/2c.; Charleston, Savannah, Wilmington, N. C., and New Orleans, 41c. Actual weight, 1c. more per cent.

**Nitrate of Soda.**—This market has been quiet during the past week. We quote: On the spot and near-by arrivals, \$2; shipments, \$1.97 1/2.

**Liverpool, Oct. 3.**

(Special Report of Joseph P. Brunner & Co.) Business in chemicals in this market is dull and uninteresting. Quotations are nominally without

change, but, all round, prices are more or less of a nominal character and unreliable.

The chief items of interest here are the fluctuations in Alkali Company's shares and the reports of the cutting of prices for caustic soda in the United States. The Alkali Company's shares had a smart drop in the early part of last week, but recovered again; they are weaker this week, although still 12s. 6d. to 15s. up from the bottom touched about a week ago.

Soda ash slow for Leblanc makes, and quotations quite nominal at about as follow: Caustic ash, 48%, £3 15s. @ £4 per ton; 57 and 58%, £4 10s. @ £4 15s. per ton. Carb. ash, 48%, £3 5s. @ £3 15s.; 58%, £3 15s. @ £4 per ton, net cash. Ammonia ash, 58%, in good demand and firm at £3 10s. per ton, net cash; for tierces, and 5s. less for bags. Soda crystals flat at £2 10s. per ton, less 5%.

Caustic soda in light request, and nominal spot range, according to market is about: 60%, £6 15s. @ £7 15s. per ton; 70%, £7 15s. @ £8 15s. per ton; 74%, £8 15s. @ £9 15s. per ton; 76%, £9 15s. @ £10 15s. per ton, net cash. For parcels under 10 tons 5s. per ton extra is charged.

Bleaching powder inactive, and for hardwood packages, £7 5s. to £7 15s. per ton, net cash, are nominal quotations, according to export market.

Chlorate of potash depressed, and resellers offering for prompt delivery at 5%.

Bicarb. soda quiet but firm at £6 15s. per ton, less 2½% for 1 cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia dull at about £13 7s. 6d. @ £13 8s. 9d. per ton, less 2½%, for good gray 24-25% in double bags f. o. b. here, as to quality and holders' views.

Nitrate of soda quiet at £9 5s. @ £9 7s. 6d. per ton, less 2½% for double bags f. o. b. here.

Carb. Ammonia.—Lump, ¾d. per lb.; powdered, 4d. per lb., less 2½%.

**MINING STOCKS.**

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburg, St. Louis, London and Paris, see pages 358 and 360.]

**NEW YORK, Friday Evening, Oct. 12.**

The mining stock market continues to drag along without any apparent increase in activity. The spurt which we reported last week has proven, like its predecessors for the last three years, shortlived. This week the total sales amounted to only 6,250 shares.

The attempt to create a "boomlet" in some of the Comstock stocks proved abortive. Prices, with very few exceptions, have declined, and it looks as if last week's movement was only a repetition of similar attempts in the past, namely a desire on the part of certain people to profit at the expense of the lambs. Consolidated California & Virginia declined from \$6.25 to \$4.75, with sales for the week of 300 shares. Best & Belcher fluctuated between 98c. and \$1.55, and at these prices 450 shares changed hands. All the other Comstock stocks were quiet. The following sales were made: 100 shares of Gould & Curry at \$1.10; 300 shares of Hale & Norcross at 95¢; 110 shares of Sierra Nevada at \$1.20 @ \$1.45; 100 shares of Yellow Jacket at 86c.; 200 Chollar at 83c.; 200 shares of Mexican at \$1.10 @ \$1.55; 100 shares of Potosi at 80c.; 100 shares of Union Consolidated at \$1.10, and 500 shares of Utah at 16c.

Of the California stocks the only one to show any transactions is Brunswick Consolidated, of which 600 shares were sold at 4c.

The Colorado shares were in slightly better request this week. Sales of Leadville Consolidated aggregated 1,300 shares at 8c. Of Little Chief 300 shares changed hands at 15c. Lacrosse was in better demand and ruled firm at 5c., the total sales for the week being 1,500 shares. The annual election of the Colorado Central Consolidated Mining Company will be held at the office of the company, No. 48 Exchange Place, New York City, on November 8th, at 11:30 a. m. Transfer books close on October 27th and reopen on November 10th.

The annual meeting of the stockholders of the Comstock Tunnel Company was held at the office of the company this week. There were represented 1,340,000 shares. The opposition to Mr. Sutro took the shape of a rival ticket, and after considerable discussion a compromise was effected by which both sides elected some of their men to the board of directors. The following board was elected: Theodore Sutro, Otto Lowengarde, Elisha Dyer, Jr., Julius A. Strugsberg, Maurice L. Muhleman, J. E. Knapp and H. Hobart Smith. The following officers were then elected: President, Mr. Theodore Sutro; vice-president, Elisha Dyer, Jr.; and secretary and treasurer Maurice L. Muhleman. The treasurer's statement showed that the balance on hand September 1st, 1894, was \$16,413, the operating expenses during the past year were \$36,202, and there was a deficiency of \$21,483. Against this deficiency is a surplus fund of about \$19,000. The bonded indebtedness of the company is \$1,908,000, the floating indebtedness \$6,163, and the stated assets \$6,481,582.

**Boston. Oct. 11.**

(From our Special Correspondent.)  
In the early part of this week there was a good degree of activity in the market for the copper stocks, especially for the Montana group, which scored quite an advance in prices, but in the later dealings weakness was developed which carried prices nearly back to last week's closing. Boston & Montana ad-

vanced from \$29½ to \$31, reacted to \$30, at which sales were made to-day. Butte & Boston improved also from \$10½ to \$11½, losing the advance within ¼, and closing at the opening price. The bulk of business was in these two stocks, the aggregate footing up nearly 5,000 shares. The Lake Superior stocks were generally steady, with light transactions and, with the exception of Tamarack, the range of prices was higher. Tamarack, which closed last week at \$158, advanced to \$160 and declined to \$157 in the latest dealings. Calumet & Hecla advanced to \$298 for 10 shares, and closed \$295 bid, \$300 asked. Quincy was in better demand, and advanced \$1 to \$94, while the scrip was neglected. Franklin also gained a point, advancing from \$10 to \$11, with none offered under \$11½. Osceola advanced to \$24½, losing ¾ in later dealings. Kearsarge advanced ¼ to \$7½, closing at \$7½. Centennial sold at \$1½ and closed at \$1. Small lots of Atlantic sold at \$10½ and \$10. Tamarack, Jr., advanced from \$10½ to \$11½ on sales of 200 shares. Wolverine sold at \$3 and \$2½, but was not very active. Allouez sold at 50c., a gain of 20c. over last sale.

3 P. M.—Closing Prices.—Boston & Montana, \$30 bid, \$30½ asked; Butte & Boston, \$10½ bid, \$11 asked; Calumet & Hecla, \$295 bid, \$300 asked; Franklin, \$10½ bid, \$11½ asked; Quincy, \$90 bid, \$95 asked; Tamarack, \$156 bid, \$158 asked; Quincy scrip, \$35 bid, \$37 asked.

**San Francisco.**

BY TELEGRAPH.

SAN FRANCISCO, Cal., Oct. 12.—The course of the market during the past week has been a steady decline in prices. To-day's opening quotations were as follows: Best & Belcher, \$1.40; Bodie, \$1.30; Bulwer, 11c.; Chollar, 70c.; Consolidated California & Virginia, \$5; Eureka Consolidated, 35c.; Gould & Curry, 70c.; Hale & Norcross, 93c.; Mexican, \$1.40; Mono, 18c.; Navajo, 10c.; Ophir, \$2.95; Savage, 74c.; Sierra Nevada, \$1.10; Union Consolidated, 83c.; Yellow Jacket, 87c.

**Paris. Oct. 1.**

(From our Special Correspondent.)

Our Bourse here still continues to show an increase, a little slow, it is true, but still an increase, in speculative movement. One sees a larger amount of sales, and the lower-priced shares, the value of which is chiefly in the future, are more in demand than they have been for months. Another feature which is favorable is that there is some buying, either for investment or against a rise next year, and not for an immediate turn in the market. This, too, in spite of some unfavorable rumors which I note below. Part of this may be due, as I have said in earlier letters, to the pressure of unemployed money; but part also is the result of greater confidence in the future.

The metallurgical shares are showing a little better, and have generally held their own. Acieries de France have gained a little, as have also the Creusot and Chaillon-Commentry. Nearly all of these companies have a fair amount of work, but have had to take their contracts at low prices. The iron and coal stocks have also been steady, but have shown no very marked fluctuations, except Dombrowa, which is gaining.

The copper market continues to hold some of the recent rise in prices, and the copper stocks are firm in consequence. Rio Tinto and Cape copper are higher, and Jerez-Lanteira shares have also gained a little. The weak point seems to be in the continued large production of your mines, which still far exceeds the limits fixed by the old convention. In Europe the output is, if anything, below those limits.

As to the other metals the lead shares have been generally strong, and Laurium is especially in demand. In the zinc shares Malfidano holds its late advance. Nothing further is heard of the proposed zinc syndicate, probably because the Malfidano and the Vieille Montagne companies, having made their own convention, do not care to go further. In Nickel Company shares there have been further fluctuations and a slight gain.

Huanchaca, our only prominent silver stock, is still active and on the whole strong. The Transvaal gold stocks have also been active and have gained in sympathy with the London market. Langlaagte is a chief favorite here. It seems as if there might be an opportunity to introduce some of your higher class gold stocks to our speculators a little later. De Beers diamonds are steady.

An analysis of the details of our foreign trade returns for the eight months ending with August, of which you have had the figures in gross, does not show well. There has been a serious decrease this year in our exports of manufactures of wool, silk, cotton and leather, as well as of objects of art and luxury. In the imports there is a great increase, chiefly in grains and flour.

It is not well, perhaps, to speak of one's own predictions, but it may interest you to note that the failure of the subscription to the new Panama stock and the continued fall in price of the old company's securities prove that our people, usually so tenacious of their beliefs, have at last lost all faith in the canal. That the new company's work will be continued few think probable now.

Interest in the Japan-China war is for the moment eclipsed by the talk about the illness and probable early death of the Czar of Russia. It is well known that his personal wish has been strongly for peace, and that has kept Russia quiet. Now it is talk here in certain circles that if he dies his real successor will be his brother Vladimir—whether as regent or as Czar through one of those palace revolutions which

are still possible in Russia—for it is believed that the young Czarevich is neither mentally nor physically able to reign. Now Vladimir is an active man, and a believer in Russian power, and he will certainly not make such sacrifices for peace as his brother has approved. While on this subject it is curious to note that the Danish blood, while it may have brought beauty into the Russian and English royal families, certainly did not carry brains. All this may seem to you mere gossip, but you should realize how closely diplomacy and dynastic politics are related to our stock market here.

The Corps Legislatif will meet soon and will have as its first work the consideration of the yearly financial bill or budget prepared by M. Poincare. Tariff arguments will have some place, though no change in our present policy is to be expected.

A report I have just heard, which comes by the way of Belgium, is that your great Baldwin Locomotive Works in Philadelphia are negotiating for the establishment of a branch in Russia, probably on the banks of the Volga. An order for 500 locomotives for the Siberian Railroad is the chief motive. A Mr. Gordon is said to have charge of the transaction for the Baldwin company. AZOTE.

**London. Sept. 29.**

(From our Special Correspondent.)

Three months ago I said in this column that a general revival in business might be expected at the end of summer. This revival has now come, and everybody in London is hopeful and on the alert. The many companies formed to work West Australian goldfields, which have been in an embryonic state for half a year, are now being brought before the public, and speculation in them on the exchange is very lively. A new company comes out almost every day. This West Australian boom is bringing back to life the dead mining market. The cloud of distrust which has hung over the city ever since the Baring collapse has been partly blown away by the recent statement of the Governor of the Bank of England, to the effect that the liquidation of the Baring estate is at least on the point of completion and that the guarantors will not be called on. The internal scandals of the Bank of England have become ancient history, and the worst regarding the trust companies has been got over. The ground has therefore been cleared for a revival of speculation; all that was required was something new and promising, to give the necessary fillip. This has been supplied by the West Australian gold discoveries.

It must be noted here that in this case as in all first booms it is very difficult to tell good companies from bad, and no doubt the shareholders in some of those which have already come out will lose their money. One of them in particular, the West Australian Exploration, starts under circumstances adverse to success, seeing that the promoter is a man who has a very bad previous record both in England and in America. Either the English press have been bribed or they are afraid of the libel laws, but whatever the reason, not a word has been said in the daily papers advising against this particular company.

There is one very important and new feature in the pursuit of gold mining by London capitalists which should be brought prominently before economists. In many influential quarters gold mining is being strongly encouraged with the object of producing steady supplies of gold as a commercial commodity. They believe that in order to make a universal gold standard possible the world's supply of gold must be considerably increased. The influence of the Rothschilds is very strong in this direction and it is easy to see their ultimate object. As time goes on, it will be seen that the production of gold in South Africa, India, Australia and other parts governed from London will be as regular and businesslike as the Lancashire cotton trade, producing gold as a genuine trade commodity.

Of mining news relating to American companies there is none this week, business in them has been neglected entirely for the West Australian boom.

**DIVIDENDS.**

American Developing and Mining Company, dividend No. 2, of 12½c. per share, \$30,496, payable October 11th at the office of the company, No. 211 N. Main street, Butte, Mont.

Bald Butte Mining Company, dividend No. 30, of 5%, \$12,500, payable October 3d at the office of the company, in Helena, Mont.

Hecla Consolidated Mining Company, dividend No. 130, of 1% per share, \$15,000, payable October 25th at the office of the company, Glendale, Beaverhead County, Mont.

**MEETINGS.**

Consolidated California & Virginia Mining Company, at the office of the company, Room 58, Nevada Block, No. 309 Montgomery street, San Francisco, Cal., October 15th, at 1 p. m.

Eureka Consolidated Mining Company, at the office of the company, No. 134 Market street, San Francisco, Cal., October 15th, at 12 o'clock noon.

Exchequer Mining Company, at the office of the company, No. 79 Nevada Block, No. 309 Montgomery street, San Francisco, Cal., October 15th, at 11 a. m.

Mayflower Gravel Mining Company, at the office of the company, No. 330 Line street, San Francisco, Cal., October 15th, at 10 a. m.

NEW YORK MINING STOCK QUOTATIONS.

Table with columns for Name and Location of Company, Oct. 6, Oct. 8, Oct. 9, Oct. 10, Oct. 11, Oct. 12, and Sales. Divided into Dividend-paying mines and Non-dividend-paying mines.

Ex-dividend. † Dealt in at New York Stock Ex. Unlisted securities. ‡ Assessment paid. § Assessment unpaid. Dividend shares sold, 2,600. Non-dividend shares sold, 3,650. Total shares sold, 6,250.

BOSTON MINING STOCK QUOTATIONS.

Table with columns for Name of Company, Oct. 5, Oct. 6, Oct. 8, Oct. 9, Oct. 10, Oct. 11, and Sales. Lists various mining companies from Allouez, Mich. to Wolverine, Mich.

Dividend shares sold, 3,803. Non-dividend shares sold, 2,435. Total shares sold, 6,238.

COAL AND COAL RAILROAD STOCKS.

Table with columns for Name of Stocks, Oct. 6, Oct. 8, Oct. 9, Oct. 10, Oct. 11, Oct. 12, and Sales. Lists coal and railroad stocks like Am. Coal, Balt. & Ohio, etc.

\* For week commencing Oct. 5 and ending Oct. 11. Total shares sold, 35,824.

INDUSTRIAL AND TRUST STOCKS.

Table with columns for Name of Stocks, Oct. 6, Oct. 8, Oct. 9, Oct. 10, Oct. 11, Oct. 12, and Sales. Lists industrial and trust stocks like Adams Express, Am. Cotton Oil, etc.

Total shares sold, 391,322.

CALIFORNIA.

Table with columns for Name of Stocks, Oct. 5, Oct. 6, Oct. 8, Oct. 9, Oct. 10, Oct. 11. Lists California stocks like Allouez, Mich., Arnold, Mich., etc.

COLORADO.

Table with columns for Name of Stocks, High, Low, Oct. 8. Lists Colorado stocks like Alamo, Amity, Anaconda, etc.

FOREIGN.

Table with columns for London Quotations, Oct. 4, 1894. Lists foreign stocks like Alaska Mex'n, Alaska Treadwell, etc.

MARYLAND.

Table with columns for Name of Stocks, Oct. 12. Lists Maryland stocks like Balt. & N. C., Big Vein Coal, etc.

PENNSYLVANIA.

Table with columns for Name of Stocks, Oct. 12. Lists Pennsylvania stocks like Cambria, Catawissa, Central Coal, etc.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns: Name and Location of Company, Capital Stock, Shares, Par, Assessments, Dividends, and Name and Location of Company, Capital Stock, Shares, Par, Assessments. Lists various mining companies and their financial details.

Gold, Silver, Lead, Copper, Borax. \* Non-assessable. † The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ‡ Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends, and the Cons. Virginia \$12,330,000. § 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 \$2,400,000 in dividends against \$425,000 in assessments.

Table with columns for 'COLOKADO. Aspen.' and 'MINNESOTA. Duluth.' listing various mining stocks and their prices.

Table for 'MISSOURI. St. Louis.' listing closing quotations for various stocks.

Table for 'MONTANA. Helena.' listing prices for various commodities and stocks.

Table for 'PENNSYLVANIA. Pittsburg.' listing prices for various mining and industrial stocks.

Table for 'Philadelphia Co.' listing various stocks and their prices.

Table for 'UTAH. Salt Lake City.' listing prices for various stocks and commodities.

Table for 'FOREIGN. Shanghai, China.' listing prices for various international stocks.

Table for 'FOREIGN. Paris, France.' listing prices for various European stocks.

Table for 'FRANCE.' listing prices for various French stocks and commodities.

Table for 'ASSESSMENTS.' listing company names, dates, and assessment amounts.

CURRENT PRICES.

Table listing current prices for various commodities such as acids, alums, and salts.

Table listing current prices for various minerals and metals including cadmium, iron, and copper.

Table listing current prices for various oils, phosphorus, and other industrial materials.

Table listing current prices for various tin and zinc products.

THE RARER METALS.

Table listing prices for rarer metals such as arsenic, barium, bismuth, and others.



**RAILROAD MATTERS.**

Mr. William L. Bull, of New York, has been elected president of the Minneapolis & St. Louis Company.

Mr. Willard A. Smith has been appointed honorary curator of transportation of the department of industrial arts of the Field Columbian Museum, of Chicago.

Mr. William H. Russell, chief engineer of the Boston & Albany, has been made consulting engineer, and his former office will be filled by Mr. Walter Shepard, of Boston, who has been assistant chief engineer for several years. Mr. Russell is now about 76 years old, and he has been chief engineer of the Boston & Albany and its predecessor since 1858. He worked with the surveyors in the construction of the road as far back as 1838, but was a farmer from 1842 to 1845, and then worked as an engineer in the construction of the New York & New Haven and New London Northern and other roads before returning to the Boston & Albany.

An important suit has been filed in the United States Circuit Court in Cincinnati, by the Interstate Commerce Commission, which complains that Samuel M. Felton, receiver; the Louisville & Nashville; East Tennessee, Virginia & Georgia; Southern Railway Company; Western & Atlantic; Nashville, Chattanooga & St. Louis; Alabama Great Southern; Atlanta & West Point; Central Railroad and Banking Company of Georgia; Georgia Pacific; Norfolk & Western, and 24 other railroads have violated the provisions of an Act to Regulate Commerce, and that of May 29th, 1894, have published, kept in effect and charged certain freight rates below those established by the commission, and have cut rates to more than 50% less than the rates ordered, and again, on June 23d and 25th, receivers and agents and their successors kept a continuance of lower rates in force for more than a month thereafter, and on August 1st raised the rates considerably in excess of the rates established by the Interstate Commerce Commission, and since then and at divers times have willfully violated, disobeyed, disregarded and wholly neglected and refused to comply with the provisions and requirements of the orders of the Interstate Commerce Commission.

Judge Sage issued an order directed to the officials of all the roads named in the petition, and orders that the defendants file answers to the petition between Monday, October 22d, and appear in court Monday, November 19th, and then and there show cause why the order of the commission should not be deemed and held lawful. It is also ordered that the proceedings shall be conducted in a summary manner that will speed the hearing and determination of the matter involved without the formal pleadings, rules and proceedings applicable to ordering suits in equity. The secretary of the commission is authorized to make service of the orders of the court to the president, vice president, secretary, general manager or general superintendent of each of the corporate defendants.

The Interstate Commerce Commission has, in compliance with a resolution of the Senate, compiled some data regarding the ownership of railroads by foreign governments. The Commission states that ten countries do not own or operate railways, viz., Colombia, Great Britain and Ireland, Mexico, Paraguay, Peru, Spain, Switzerland, Turkey, United States and Uruguay. Eighteen governments own and operate some of the railways. These are Argentina, Australasia, Austria-Hungary, Belgium, Brazil, Canada, Cape of Good Hope, Chili, Denmark, France, Germany, Guatemala, India, Japan, Norway, Portugal, Russia and Sweden. Egypt and Nicaragua own and operate practically all their railways. Greece, Holland and Italy own part of their railways, but do not operate any, leasing all the present mileage to private companies.

A comparison of passenger charges per mile shows an average in Great Britain of 4.42 c. for first class, 3.20c. for second class and 1.94 for third class. In France the average is 3.85c. for first class, 2.86c. for second class, and 2.08c. for third class. In Germany the rate is 3.10c. first class, 2.32c. second class, and 1.54c. third class. In the United States the average charge is 2.12c. The average charges per ton per mile are as follows: Great Britain, 2.80c.; France, 2.20c.; Germany, 1.64c., and in the United States 1c.


The interest on capital invested in the several countries is as follows: United Kingdom, 4.1%; France, 3.8%; Germany, 5.1%; Peru, 5.3%; Austria, 3.1%; Belgium, 4.6%; United States, 3.1%. Throughout the world it is 3.1%. In Canada about one-

tenth of the total mileage of about 15,000 miles is owned and controlled by the government. For the year 1892 the operation of the government lines resulted in a loss of over \$600,000.

It is stated that in the United States several of the States have tried ownership in a limited way. Illinois constructed a road at a cost of \$1,000,000, but disposed of it for \$100,000; Indiana had a similar experience; Georgia owns a railroad, but found it expedient to lease it to a private company; Pennsylvania constructed a railroad from Philadelphia to Columbia, but subsequently sold it; Massachusetts, Michigan and several other States tried the experiment without success.

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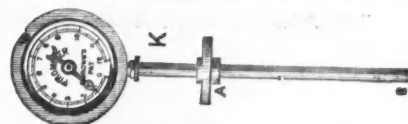
It has in its employ mining engineers whose reports it will guarantee, and desires to act as the Western agent of individuals or syndicates in the selection and purchase of mining property, doing the work on a commission. It will also advise on the operation of such, or other property of this class.

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Table with 3 columns: Advertiser Name, Page Number, and Advertiser Name. The table is organized alphabetically by advertiser name, with sections for 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, Z. Each entry includes the advertiser's name and a corresponding page number.

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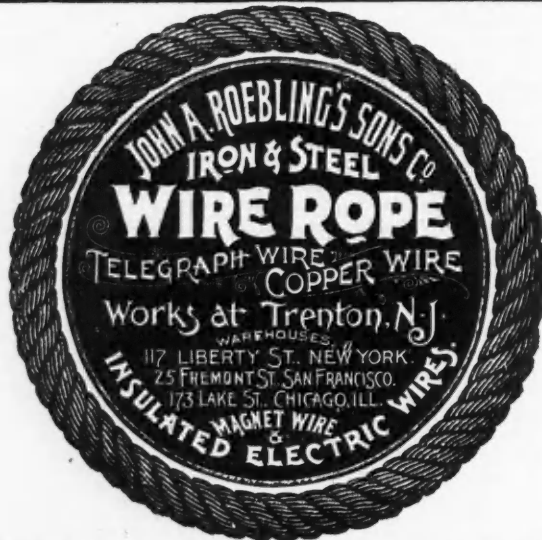
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ALL GENUINE HERCULES WIRE ROPE IS MADE WITH A RED STRAND.

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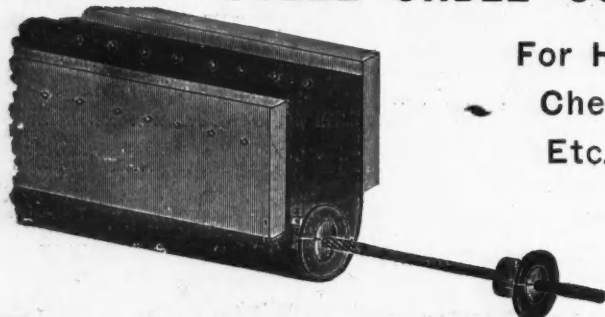
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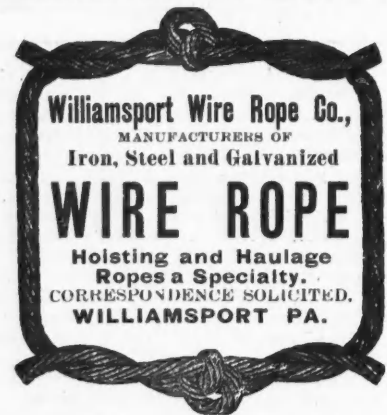


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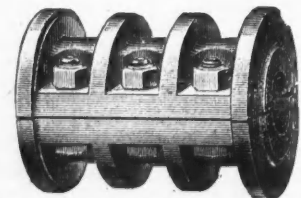


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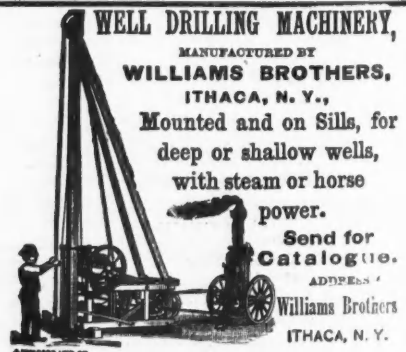
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**Iron Works Co.,**  
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Mining Machinery, Concentration and  
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Mounted and on Sills, for  
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**“ARMS & EXPLOSIVES.”**

A Technical and Trade Journal. Published  
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A Journal for Manufacturers of Guns, Explosives,  
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**EFFINGHAM HOUSE, ARUNDEL ST., STRAND**  
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CLASSIFIED LIST OF ADVERTISERS.

Air Compressors and Rock Drills. Ingersoll-Sergeant Rock Drill Co. Pullcock, M. C. Mfg. Co. ... Assayers and Chemists' Supplies. Alsworth, Wm. Baker & Adamson. ... Contractors and Miners' Supplies. Bucyrus Steam Shovel & Dredge Co. Fraser & Chalmers. ... Crusticles, Graphite, Etc. Denver Fire Clay Co. Garden City Sand Co. Crushed Quartz. Garden City Sand Co. Capsula. Garden City Sand Co.

Diamonds. Bishop, Victor, & Co. Diamond Drills. Bishop, Victor, & Co. Drawing Materials. Brandis' Sons. Dredges. Bucyrus Steam Shovel & Dredge Co. Dressing Machines. Poole, R., & Son Co. Educational Institutions. Columbian University. Electrical Machinery and Supplies. General Electric Co. Elevators, Conveyors and Hoisting. Brown Holst & Conv. Jeffrey Mfg. Co. Engineers, Chemists, Metallurgists. Adams, W. H. Askew & Russell. Gas Engines. Armstrong Brothers. Gravel. Pollock, Wm. B. & Co. Hydraulic Power. Webster, Camp & Lane. Hydraulic Power. Webster, Camp & Lane. Iron Castings. Poole, R., & Son Co. Lamps, Miners'. Stieren, Wm. E. Lead. White. Machinery. Poole, R., & Son Co. Locomotives. Hunt, C. W. Co. Machine Moulded Gearing. Fraser & Chalmers. ... Portland Cement. Atlas Cement Co. ... Tapping Machines, Gas Mains, Etc. Williams Bros.

Grain Elevators. Poole, R., & Son Co. Grease, Graphite, Etc. Iron, Jos. Crutchfield Co. Hoppers. Poole, R., & Son Co. Heavy Machinery. Fraser & Chalmers. Inspection and Tests. Hunt, The Robert W. Co. Insulated Wires and Cables. Okonite Co., Ltd. Iron Castings. Poole, R., & Son Co. Lamps, Miners'. Stieren, Wm. E. Lead. White. Machinery. Poole, R., & Son Co. Locomotives. Hunt, C. W. Co. Machine Moulded Gearing. Fraser & Chalmers. ... Portland Cement. Atlas Cement Co. ... Tapping Machines, Gas Mains, Etc. Williams Bros.

Publications. Allison Coupon Co. Arms & Explosives. Australian Mining Standard. El Minerio Mexicano. Electrical Industry. Pulleys. Poole, R., & Son Co. Pumps. Atina Fdy & Mach. Co. Allen, Chas. A. Blake, Geo. F. Mfg. Co. Rapping, Carpenter & Co. Goulds Mfg. Co. Grotzinger, A., & Sons. Quarrying Machines. Bostelman, L. F. Ingersoll-Sergeant Rock Drill Co. Sullivan Machinery Co. Union Wire Rope Tramway Co. Quicksilver. Eureka Co. Railroads. Deny & Rio Gr. R. E. | Midland R. R. of Ky. Railroad Supplies and Equipment. Carpenter, Geo. B. & Co. Robinson & Orr. Hunt, C. W., Co. | See Machinery. Excitators, Damper, Heat, Etc. De Este & Seeley Co. Jenkins Bros. Lunkenheimer Co. Blue & Robertson. Robinson & Orr. Rock Drills. (See Air Compressor.) Rolling Mill Machinery. Poole, R., & Son Co. Roofing. Berlin Iron Bridge Co. Rother Iron & Steel Roofing Co. Scaife, Wm. B. & Sons. Youngstown Bridge Co. Rope Wheels. Poole, R., & Son Co. Saws. New York Belting & Packing Co., Ltd. Safety Lamps. Wm. E. Stieren. Screens. Aitchison, R. Perf. Metal Co. Exeter Machine Works Co. Fraser & Chalmers. Harrington & King Perforating Co. (See Machinery.) Screen Plates. Harrington & King Perforating Co. Separators. De Este & Seeley Co. Harrison Safety Boiler Works. Shaling. Poole, R., & Son Co. Shoes and Dies. Fraser & Chalmers. Chrome Steel Works. Crescent Steel Co. Shovels (Steam). Bucyrus Steam Shovel & Dredge Co. Souther & Co. Smelting and Refining Works. Babach & Ref. Co. Penna. Salt Mfg. Co. Baltimore Cop'r Works. Penn. Smelting and Refining Works. Phosphor Bronze Smelting Co. Smelt. Co. Orford Copper Co. Steam Fans. Cole, Wm. E. Steel Mills, Castings, Rails, Drill Bits. Jessop, Wm., & Sons Ltd. Moore, S. L., & Sons Co. Roberts, A. & P. & Co. Robinson & Orr. Whitney, A., & Sons. (See Metal Dealers.) Tanks. Scaife, Wm. B. & Sons. Williams Mfg. Co. Tapping Machines, Gas Mains, Etc. Williams Bros. Telegraph Wires and Cables. Okonite Co., Ltd., The. Tin Plate Rolling Machinery. Poole, R., & Son Co. Traps, Steam. De Este & Seeley Co. Tubes. Pollock, Wm. B. & Co. | Williams Bros. Tubing, Rubber. New York Belting and Packing Co., Ltd. Turbines. James Luff & Co., The. Poole, Robt. & Son Co. Stilwell-Bierce & Smith-Valle Co. Turbine Water-Wheels. Poole, R., & Son Co. Stilwell-Bierce & Smith-Valle Co. Ventilation. De Este & Seeley Co. Lunkenheimer Co. Eddy Valve Co. Powell, Wm., Co. Jenkins Bros. Ventilators. Bullock, M. C. Mfg. Co. | Fraser & Chalmers. Vulcanite Slurry Wheels. New York Belting and Packing Co., Ltd. Washers. Milton Mfg. Co. Water Pressure Reducers. Mueller Mfg. Co. Water-Wheels. De Este & Seeley Co. Midland Foundry & Machine Co. Poole, R., & Son Co. Stilwell-Bierce & Smith-Valle Co. Well Drilling Machinery. Bostelman, L. F. Sullivan Machinery Co. Williams Bros. Sheffield Car Co. Wheels, Car. White Lead Machinery. Poole, R., & Son Co. Wire. Clark. Aitchison, R. Perf. Metal Co. Harrington & King Perforating Co. Wire Rope & Wire. Leachen, A., & Sons. Rope Co. Broderick & Bascom. Phelps, Dodge & Co. Rope Co. R. H. J. A. Sons & Co. Ropeways Synd., Ltd. Trenton Iron Co. Williamsport Wire Rope Co. Wire Rope Tramway. Brown Holst & Convey. Machine Co. California Wire Works. Colorado Iron Works. Cooper, Hewitt & Co. Fraser & Chalmers. Hunt, C. W. Co. Hopkin, W. A. Sons & Co. Ropeways Syndicate, Ltd. Trenton Iron Co. Vulcan Iron Works.

## FREE ADVERTISING.

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

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

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

## Positions Vacant.

**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.

**1357 THE UNITED STATES CIVIL SERVICE** Commission will hold an examination on September 25th to fill a vacancy in the position of surveyor's clerk in the General Land Office, at a salary of \$1 200 per annum. The subjects of the examination will be orthography, penmanship, letter-writing, elements of the English language, arithmetic and surveying. Those intending to apply should obtain application blanks from the Civil Service Commission without delay.

**1358 WANTED—BY A LEAD SMELTING** company a young man to act as assistant in the operation of its plant. Must be familiar with the most recent and approved methods and practices in handling and smelting custom ores, and be able to assume full charge if necessary. Must have had experience in one of the large plants. References required. Address ATLANTIC, ENGINEERING AND MINING JOURNAL.

**1359 WANTED—SIX OR EIGHT MINERS** for underground work within 100 miles from New York. Pay will be from \$1.30 to \$1.50 per day. Steady work. Address UNDERGROUND, ENGINEERING AND MINING JOURNAL.

**1360 WANTED.—TWO GOOD COPPER** matte converting men, who are also thoroughly familiar with cupola smelting, to act as foreman and handle converters. State experience, giving references. Address ONTARIO, Engineering and Mining Journal.

**1361 WANTED.—A MAN THAT HAS HAD** experience in mining feldspar and can furnish good references. Address FELDSPAR, Engineering and Mining Journal.

**WANTED—A YOUNG MINING ENGINEER:** graduate of first class technical college, who is a good mathematician and a neat draughtsman. Address M. E., ENGINEERING AND MINING JOURNAL.

## Situations Wanted.

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

**METALLURGIST OF WIDE EXPERIENCE** in the building and operation of concentrating works, lead and copper smelting works, copper converting works, silver refineries, etc., will be at liberty in a few months to make new engagement. Should like to correspond with any company requiring a superintendent either for the construction of new works or the operation of existing works. Terms very moderate. Address CONSTRUCTION, ENGINEERING AND MINING JOURNAL. No. 16,830 15.

**A PRACTICAL CHEMIST OF SCHOOLING** and experience wants position in works. Write to R. 59, American Exchange, Sansome street, San Francisco, Cal. No. 16,973; Oct. 20.

**ASSISTANT CHEMIST OR ASSAYER.**—Middle-aged man, formerly assistant with Professor Fresenius, and who has studied in the mining schools of Freiberg and Clausthal, Germany, desires position as above. Address W. G., ENGINEERING AND MINING JOURNAL. No. 16,984, Oct. 20.

**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. Salary to begin, no object; permanent position wanted. Address HONDURAS, ENGINEERING AND MINING JOURNAL. No. 17,005, e. o. w., Nov. 10.

**POSITION WANTED BY MINING EN-** gineer, 20 years' experience West and Mexico in gold, silver and copper mines; knows language and customs of Mexico. Address MINERO, ENGINEERING AND MINING JOURNAL. No. 17,006, Oct. 20.

## Contracts Open.

**IMPROVEMENT OF DELAWARE RIVER.**—U. S. Engineer Office, 1428 Arch street, Philadelphia, Pa.—Sealed proposals for dredging in the channel through Bulkhead Bar, Delaware River, will be received here until November 2d, 1894. All information furnished on application. C. W. RAYMOND, Major.

**TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C., October 9th, 1894.**—Sealed proposals will be received at this office until 2 o'clock p. m. on the 25th day of October, 1894, and opened immediately thereafter, for furnishing and delivering the draughting materials required for this office, in accordance with the specification and schedule, copies of which may be had at this office. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid should it be deemed in the interest of the government to do so. All proposals received after the time stated will be returned to the bidders. Proposals must be inclosed in envelopes, sealed and marked "Proposal for Draughting Materials, Supervising Architect's Office, Treasury Department, Washington, D. C.," and addressed to CHARLES E. KEMPER, Acting Supervising Architect. Ori.

**TREASURY DEPARTMENT, OFFICE SUPER-** vising Architect, Washington, D. C., October 16th, 1894.—Sealed proposals will be received at this office until 2 o'clock p. m. on the 13th day of November, 1894, and opened immediately thereafter, for all the labor and materials required to fix in place complete the low pressure, return circulation steam heating and ventilating apparatus for the U. S. Court House and Post-Office Building at Sioux Falls, S. Dak., in accordance with the drawings and specification, copies of which may be had at this office, or the office of the Superintendent at Sioux Falls, S. Dak. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all bids, and to waive any defect or informality in any bid, if it be deemed in the interest of the Government to do so. All proposals received after the time stated will be returned to the bidders. Proposals must be inclosed in envelopes, sealed and marked "Proposal for Low Pressure, Return Circulation Steam Heating and Ventilating Apparatus for the U. S. Court House and Post-Office Building at Sioux Falls, S. Dak.," and addressed to CHARLES E. KEMPER, Acting Supervising Architect. Ori.

**CANAL.**—Ten months' work on the Jaqui Canal, in Sonora, Mexico; the finest kind of material to handle; nearly 1,000,000 cubic meters to move; clearing and grubbing all done. To look at work, go to Guaymas, Mex., take boat from there to Medano. Notify French & Reed, at Cocorit, when you leave Guaymas; they will meet you with team at Medano. Communicate with FRENCH & REED, Cocorit, Mex., or 205 New High Street, Los Angeles, Cal.

**GRANITE—Florida.**—Sealed proposals, in duplicate, will be received until October 25th, 1894, for delivering 10,000 tons, more or less, of granite or other hard and durable rock upon the jetty at the northwest entrance to Key West harbor, Fla. All information will be furnished on application to THOS. H. HANDBURRY, Major Corps of Engineers, United States Army, St. Augustine.

**ARTESIAN WELLS.**—Fargo, N. D.—The trustees of the North Dakota Agricultural College and Experimental Station invite proposals to sink an artesian well on the experimental station grounds, 1½ miles from Edgely, N. D. The well must be 8 in. in diameter, of good wrought iron piping, all joints thoroughly connected and with proper sieve joints at terminal point to prevent choking. The amount of water required at said station will be not less than a flow of 300 gallons a minute. Each bid must guarantee a certain amount of flow at a given price, and must be accompanied by a satisfactory bond in the sum of \$5,000. All bids must be made and sent to J. B. POWER, Secretary of the Board, Fargo, until October 20th.

**BRIDGES.**—Proposals for supplying and erecting certain swing or draw bridges and fixed spans along the line of the "Main Drainage Channel" will be received by the Clerk of the said Sanitary District at Room H. Rialto Building, Chicago, Ill., until the 31st day of October. The bridges for which said tenders are invited are three in number, and their sites are as follows: Romeo, near the west end of Contract Section No. 12 of the Main Drainage Channel; Lemont, near the center of Contract Section No. 8 of the said channel; and Willow Springs, near the east end of Contract Section No. 1 of the Main Drainage Channel. Specifications and plans may be seen at the office of the Chief Engineer, Rialto Building, Chicago, Ill. THOS. F. JUDGE, Clerk.

**BREAKWATER.**—Milwaukee, Wis.—Sealed proposals will be received until November 1st for Kewaukee Harbor, Wis., construction of breakwater 400 ft.; Sheboygan Harbor, Wis., pile pier construction 900 ft. All information furnished on application to JAMES F. GREGORY, Major of Engineers.

**NAVAL SUPPLIES.**—Sealed proposals, endorsed "Proposals for Supplies for the New York Navy Yard," will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until October 23d, 1894, to furnish at the New York Navy Yard a quantity of pig iron, safes, nuts, bolts, rivets, brushes, brooms, moldering sand, fire brick, fire clay, hardware, belting, leather, lumber, alcohol, polishing paste, white zinc and linseed oil. The articles must conform to the Navy standard and pass the usual naval inspection. Blank proposals will be furnished upon application to the Navy Pay Office, New York. EDWIN STEWART, Paymaster General, U. S. Navy.

**DREDGING.**—U. S. Engineer Office, 349 Carondelet street, New Orleans, La.—Sealed proposals for extension of East jetty and for dredging at harbor of Sabine Pass, Tex., will be received here until October 29th, 1894. Information furnished on Application. JAMES B. QUINN, Major Engineers.

**DREDGING.**—U. S. Engineer Office, 1428 Arch street, Philadelphia, Pa.—Sealed proposals for dredging in Rancocas River, N. J., will be received here until November 5th, 1894. All information furnished on application. C. W. RAYMOND, Major Engineers.

**ELECTRIC LIGHTING.**—Sterling, Ill.—Sealed bids will be received by the Chairman of the Light Committee of the City Council until October 15th, for lighting the streets of this city by electricity. Means, lighting of 200 lights, to be suspended at street intersections, or on poles at such other places as the city may direct. The terms of the contract to be for a period of ten years, from November 5th, 1894; the city to have the option to increase the number of lamps at any time at the same rate. The successful bidder to have the exclusive franchise for commercial lighting. A certified check, payable to the order of the Mayor, for the sum of \$300, must accompany each bid, as a guarantee that the party to whom the contract is awarded will, within ten days, execute an acceptable bond and sign contract. Any further information desired will be furnished by JOHN MEE, Chairman Light Committee.

**BRIDGE MASONRY.**—"Proposals for supplying and erecting certain bridge masonry along the line of the Main Drainage Channel" will be received by the Clerk of the said Sanitary District at Room H. Rialto Building, Chicago, Ill., until October 31st. The bridges for which the said tenders are invited are three in number and their sites are as follows: Romeo, near the west end of Contract Section No. 12 of the Main Drainage Channel; Lemont, near the center of Contract Section No. 8 of the said Channel; and Willow Springs, near the east end of Contract Section No. 1 of the Main Drainage Channel. All proposals must be made upon blank forms furnished by the Sanitary District, and must give the price for each separate item of the work as provided in said forms. The bids will be compared in accordance with the terms of the specifications. Specifications and plans may be seen at the office of the Chief Engineer, Rialto Building, Chicago, Ill. THOMAS F. JUDGE, Clerk.

**DREDGING.**—Milwaukee, Wis.—Major J. F. Gregory invites bids up to November 1st for dredging 200,000 cu. yds in Green Bay Harbor, Wis.

**WATER SUPPLY.**—Little Rock, Ark.—Capt. Robt. R. Stevens invites bids up to October 30th for water supply for new post near Little Rock.

**U. S. ENGINEER OFFICE, WILMINGTON, N. C.**—Sealed proposals for dredging in Waterway between Beaufort Harbor and New River, N. C., will be received here until November 7th, 1894. All information furnished on application. W. S. STANTON, Major Engrs.

**FILTERING PLANT.**—Beaver Falls, Pa.—Bids will be received until November 6th, for a complete filtering plant, with capacity of 3,000,000 gallons in 24 hours, and buildings to contain the pumps, boilers and filtering plant. Address SAMUEL CREESE, Chairman of Building Committee.

**WATER-WORKS.**—Sealed proposals will be received by the town of Cambridge City, Ind., until October 25th, 1894, for furnishing the materials and constructing a system of water-works for said town. There will be required about 350 tons of cast iron pipe, 19,000 lbs. of special castings, 46 hydrants, brick pumping station and chimney, two pumps of combined capacity of 2,000,000 gallons per day, two boilers, pump well, the necessary valves, valve boxes etc. Bids will be received for furnishing materials above or for constructing the works complete. Proposals must be addressed to M. L. Young, Chairman of Water-Works Committee, and must contain a certified check or its equivalent, made payable to the Treasurer of Cambridge City, Ind., in an amount equal to two (2) per cent. of the amount of the bid. Plans may be seen and specifications and blank form of proposal procured at the office of the Town Clerk, Cambridge City, Ind., M. L. YOUNG, President pro Tem.; C. H. TABKE, Town Clerk; VOORHEES & WITMER, Engineers, Buffalo, N. Y.

**SEALED PROPOSALS** will be received by the Building Committee of Beaver Falls, Pa., Council, until October 18th, for two 3,000,000 gallon pumps, and for the building of a 6,000,000 gallon reservoir. Also, at 3 p. m. of 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. Korr, and also at the office of the Engineers, James H. Harlow & Co., Times Building, Pittsburg, Pa., and Wilkinsburg, Pa., two weeks previous to the above dates. At the time and dates above mentioned the several proposals will be received and publicly opened and read. A certified check will be required of bidders for 2½% of bid. The right is reserved to reject any or all bids. SAMUEL CREESE, Chairman; H. F. DILLON, L. S. LUTTON, A. O. MEYERS, TITUS W. WELSH, Building Committee. JAMES H. HARLOW & Co., Engineers.

**U. S. ENGINEER OFFICE, WILMINGTON, Del.**—Sealed proposals, in triplicate, will be received here until Nov. 9, 1894, for dredging in the following named localities, viz.: Chester River, Md.; Choptank River, Md.; La Trappe River, Md.; Warwick River, Md.; Wicomico River, Md.; and Manokin River, Md. All information furnished on application. WM. F. SMITH, U. S. Agent.

**NAVAL SUPPLIES.**—Sealed proposals, indorsed "Proposals for Supplies for the Navy Yard, Mare Island, Cal.," will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until October 30th, 1894, to furnish at the Mare Island Navy Yard, a quantity of spikes, steel rails, shingles, railroad ties, lime, sand, cement, brick, hardware, lumber, rivets, iron, steel, metals, pipe and pipe fittings, bushings, nuts, brushes, dry goods, leather, tools, pig iron, copper, packing and oars. The articles must conform to the Navy standard and pass the usual naval inspection. Blank proposals will be furnished upon application to the Navy Yard, Mare Island. EDWIN STEWART, Paymaster General, U. S. Navy.

Continued on page 19.

MACHINERY AND SUPPLIES FOR SALE.

RAILS FOR SALE.

These Selected Second-hand T Rails in good condition to relay: 60-lb. Steel, Western Penna. or Eastern Ohio delivery. 20-lb. Northern. If you can use any of the above, or any second-hand 30-lb. Iron Rails for Penna. delivery, write us. We sell new Steel Rails.

ROBINSON & ORR, No. 419 Wood St., Pittsburgh, Pa.

DOUBLE CORLISS CONDENSING ENGINE. 600 H. P.; one 1-in. by 42-in Corliss engine, 125 H. P.; double automatic engine, 350 H. P.; two 100-H. P. Phoenix automatic compound engines, 45 and 5 H. P.; Westinghouse engine, one 80 H. P. Deek engine, one 7 x 7 Southwark automatic engine, one 4-H. P. Otto gas engine, 100, 200, 300 and 500-H. P. feed-water heaters, 30 to 100 H. P. return tubulars, 70-H. P. Locomotives, 60-H. P. vertical boilers, good for 100 pounds. FRANK TOOMEY, Office 131 N. 3d St, Philadelphia, Pa. Warehouses, 974 to 980 Beach Street, 159 to 161 Canal Street.

FOR SALE.

A New Steam Dredge,

Built by Marion Steam Shovel Company; capacity of dipper, one cubic yard; daily capacity of dredge, 600 to 900 cubic yards per 10 hours. Also 5 1/2-ton Locomotive and 15 side-dump cars of two cubic yards capacity, 36-in. gauge; together with about 5,000 ft. 16-lb. iron rail.

The above machinery is new (locomotive and cars built by Ryaa, McDonald & Co., of Baltimore, Md.), and is now in Florida, where it will be sold cheap for cash or approved paper.

Address L., P. O. Box 542 Syracuse, N. Y.

Harris-Corliss Steam Engine FOR SALE, CHEAP.

One Pair of 26 x 60-in. Non-Condensing Engines, with wheel 24 ft. by 96-in. in first-class order. Will be taken out about November 1st.

APPLY TO THE WATTS-CAMPBELL CO., NEWARK, N. J.

MACHINERY FOR SALE.

Planer, 28 in. x 24 in. x 7 ft., new; Drill Press, 40 in. swing, new; Engine Lathe, 24 in. x 25 ft. bed, second-hand; Root's Blowers, Nos. 1, 2, 5 and 6, second-hand; Haskin Vertical Engine, 9 x 9, second-hand; Baxter Engine and Boiler, 6 and 8 H. P., second-hand; Vertical Boiler, 40 H. P., second-hand; Open-die Bolt Cutter, 1/2 to 1 1/2, second-hand.

WRITE US BEFORE BUYING. COOKE & CO., Machinery and Supplies, 163 & 165 WASHINGTON ST., NEW YORK.

FOR SALE.

I have a property to sell containing Magnetic and Hematite Ore; also good Molding Sand and Fire Clay and Manganese; near Railroad.

Would take City Property in part payment. Buildings suited for Summer Residence.

CALL ON OR ADDRESS AARON VAN BUSKIRK, Vienna, Warren Co., N. J.

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Contracts Open.

Continued from page 18.

DREDGING, ETC.—U. S. Engineer Office, 366 Milwaukee street, Milwaukee, Wis.—Sealed proposals for: Green Bay Harbor, Wis., dredging 200,000 cubic yards; Keweenaw Harbor, Wis., pile pier extension, 325 feet; Manitowoc Harbor, Wis., construction of breakwater, 400 feet; Sheboygan Harbor, Wis., pile pier construction, 900 feet—will be received here until November 1st, 1894, and then publicly opened. All information furnished on application. JAMES F. GREGORY, Major of Engineers.

RECONSTRUCTION OF BRIDGE, STONE, Lumber, Metal Roofing, Etc.—U. S. Indian Service, Shoshone Agency, Fremont County, Wyo.—Sealed proposals, endorsed "Proposals for Reconstruction of Bridge, Etc.," as the case may be, and addressed to the undersigned at Shoshone Agency, Fremont County, Wyo., will be received at this agency for furnishing the necessary materials and labor and removing and rebuilding the bridge across Big Wind River on the Shoshone reservation, Wyoming, and constructing of approaches thereto, on a site to be selected by the undersigned; also for furnishing and delivering at this agency about 540 perch of stone, laid in wall; 24,850 ft. of assorted lumber, 18 window, and 42 squares of roofing metal, a full list and description of which may be obtained upon application to the undersigned. Proposals for reconstruction of bridge must state the length of time proposed to be consumed in the work. Proposals for the stone, lumber, etc., must state specifically the proposed price of each article. For information as to bridge site, etc., apply to CAPT. F. H. RAY, U. S. Army, Acting U. S. Indian Agent.

NAVAL SUPPLIES.—Sealed proposals, indorsed "Proposals for Supplies for the Navy Yard, Mare Island, Cal., to be opened November 10th, 1894," will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until November 10th, 1894, to furnish at the navy yard, Mare Island, Cal., a quantity of nuts, washers, rivets, brushes, brooms, canvas, twine, fire brick, muslin, needles, hardware, leather, lamp-wick, lumber, metals, iron, steel, hose, packing, alcohol, paints, oils, varnishes, turpentine, tallow, pipe and fittings, small tools, cotton waste and soap. Blank proposals will be furnished upon application to the Navy Pay Office, San Francisco, Cal., or the Navy Yard, Mare Island, Cal. EDWIN STEWART, Paymaster-General, U. S. Navy.

DREDGING.—U. S. ENGINEER OFFICE, Wilmington, N. C.—Sealed proposals for dredging in Lockwood's Folly River, N. C., will be received here until November 7th, 1894, and then publicly opened. All information furnished on application. W. S. STANTON, Major Engrs.

BUILDING.—U. S. Engineer Office, Duluth, Minn.—Sealed proposals for the building of two signal stations on Minnesota Point, Minn., will be received here until November 10th, 1894. Further information given on application. CLINTON B. SEARS, Major Engineers.

DREDGING.—U. S. ENGINEER OFFICE, 89 Flood Building, San Francisco, Cal.—Sealed proposals for dredging in Petaluma Creek, Cal., will be received here until Nov. 1, 1894. All information furnished on application. W. H. HEUER, Major, Engineers.

DREDGING.—U. S. ENGINEER OFFICE, Charleston, S. C.—Sealed proposals for dredging Brickyard Creek, S. C., will be received at this office until Nov. 14, 1894, and then publicly opened; All information furnished on application to this office.

100-TON SHEAR LEGS.—BUREAU OF YARDS and Docks, Navy Department, Washington, D. C.—Sealed proposals, in duplicate, endorsed "Proposals for 100-ton Shear Legs at League Island," will be received at this bureau until Nov. 5, 1894. Specifications and blank forms of proposals will be forwarded upon application to this bureau or the commandant of the navy yard, League Island, Pa. Bidders are expected to fully inform themselves of the character of the work required by visiting the yard, where plans may be examined. A bond for the sum of \$3,000 must accompany bids for the work. E. O. MATTHEWS, Chief of Bureau.

WATER SUPPLY.—Office Chief Quartermaster, Chicago, Ill.—Sealed proposals, in triplicate, will be received here and at office of Post Quartermaster, Fort Reno, O. T., until November 7th, 1894, and then opened, for construction at Fort Reno, O. T., of a boiler and pump-house and new water supply system. Information furnished on application here or to Post Quartermaster at Fort Reno. Envelopes containing proposals should be marked "Proposals for Boiler and Pump-House" or "Water Supply System," and addressed to undersigned, or Post Quartermaster at Fort Reno. J. D. BINGHAM, Asst. Q. M. G.

STEEL DECK PLATES.—Office of the Chief of Ordnance, Washington, D. C.—Sealed proposals, in duplicate, will be received at this office until Oct. 29, 1894, for 10 steel deck plates, as described in the specifications of this date, to be of American manufacture and without bolts or nuts. Blank forms on which proposals must be made and all information required by bidders can be had upon application to Brig.-Gen. D. W. FLAGLER, Chief of Ordnance, U. S. Army.

BOILER WORK.—Office Custodian, U. S. Post Office and Sub-Treasury, Boston, Mass.—Sealed proposals will be received at this office until October 26th, 1894, for all the labor and materials required for resetting complete four boilers in the above-named building, in accordance with the drawings and specification, copies of which may be had at this office. Proposals must be enclosed in envelopes, sealed and marked "Proposal for Resetting Boilers in the U. S. Post Office and Sub-Treasury at Boston, Mass.," and addressed to J. W. COVENEY, Custodian.

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