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In its last quarterly report the electrical bureau of the National Board of Fire Underwriters gives a list of fires caused by electricity and electric lights. Some of the causes are instructive and should be studied by all users of electricity. They show that the heat of incandescent electric lights is sufficient, under certain circumstances, to start fires in materials around them, even though the globe and socket remain intact and no short circuiting occurs. Many examples are given to illustrate this, some of them of a striking nature. One instance is given where the sparks, usually harmless, from an arc lamp without a spark arrester ignited cloaks on a table beneath the lamp.

In almost every case, however, ordinary care and attention or common sense would have prevented any damage. Much of it seems to have arisen from the fact that users of the electric lights did not suppose that there was any danger. For this reason it is well to give warning.

Notwithstanding the low prices of spelter which have prevailed during a considerable part of the year, mining in the Southwestern Missouri and Southeastern Kansas district has continued active. Nearly all the old mines have been at work, a number of new openings have been made and there has been little or no diminution in the number of men employed. The peculiar circumstances of the district, where most of the operations are on a small scale and are conducted by lessees with only moderate capital, while there are few large or costly mining plants, would hardly have led us to expect so much steadiness in the face of continued low prices; but probably most of the operators have been able at least to live, and have not seen much prospect of bettering themselves elsewhere. The ore market at Joplin has shown large sales throughout the year, but until recently they were made at constantly decreasing prices, as we have noted from time to time. Since the middle of October there has been a slight recovery in prices, and this may be expected to continue, though probably the gain will be slow. A considerable part of the capacity of the works owned by the smelters' combination is still closed down, and this, of course, seriously affects the ore market.

The situation at Leadville, in Colorado, remains unsatisfactory, because the peace is only maintained by the presence of an armed force, a condition which cannot last for an indefinite time. All the large mine-owners remain firm in their determination to continue to work the mines, and the large sums they have spent to provide protection for their mines and to bring men from a distance show that they are in earnest in the matter. The Miners' Union persists in its refusal to declare the strike off, though it now seems impossible for the strikers to carry their point, and it is quite probable that a number of them would be willing to give up and return to work if they could be freed from the control of the Union. The production of the district has been practically stopped for a considerable time now and the losses have been heavy, both to the mine-owners in money expended while none is coming in, and to the miners in loss of time. In addition to these, the merchants of Leadville must have suffered considerably in loss of business. Both sides, however, still reject all compromises and seem disposed to fight it out. There is general apprehension of renewed outbreaks should the troops be withdrawn. The strike is certainly one of the longest and most stubbornly contested on both sides that we have had to record for a long time.

Notwithstanding some increase in interest and some inquiries about gold-mining properties in the South, there has been no appreciable growth in the industry for some time past. Very few new mines are mentioned in the Southern States and the list of those which are steadily and successfully operated continues rather a short one. Our correspondents have mentioned one or two in Alabama which are being worked with fair prospects, and there are some in Georgia which are doing well in a small way. The Haile Mine, in South Carolina, continues to prosper under the charge of Mr. Thies, but in North Carolina very little is going on at present. That there are some exceptionally good opportunities still to be found is certain, and the advantages of climate, abundant supplies of fuel, timber and water, and of low-priced labor are incontestable. The trouble seems to be that there are few mines yet opened where the exploitation can be or has been conducted on a large scale. Capital has usually been lacking, and most of the work done has been in a small way and with imperfect appliances, very often with machinery not at all well adapted to the ores. In many cases, also, the properties supposed to contain gold have been held by the owners at prices entirely out of proportion to their value, and buyers have been kept off in this way. There is room for an increase in the industry, and economical work with care in the adoption of methods of treatment of the ores would give it a very considerable impulse.

The movement in favor of better country roads and the rapid increase in the number of towns and large villages which can afford paved streets has very much enlarged the demand for road material, and will, doubt-

the gold-mining industry, but also drew general attention to the process, and led to its trial and adoption in many other places. The MacArthur-Forrest patents taken out in the Transvaal are owned by the African Gold Recovery Company, and at first the gold-mining companies generally paid the royalties charged without question. Later some of them began to resist the payment, and a case was made up and taken into the courts, the final result being just now reached. The importance of the issue to the parties immediately in interest can be appreciated from the statement that about 30 per cent. of the gold produced by the Witwatersrand mines—that is between \$12,000,000 and \$13,000,000 yearly—is obtained by treating the tailings with cyanide, and a favorable decision would have enforced the payment of a percentage on this great sum as royalty.

The company apparently feared an adverse decision, for at an early stage in the progress of the suit it made a proposition to transfer the patents to the government of the Republic for a fixed sum, in order that the mining industry might thus be benefited. This proposition was strongly urged, but was not accepted.

The validity of the patents was passed upon adversely by the English courts, but the case was never carried up to the highest court in that country, as the Cassel Company was allowed, in accordance with a suggestion made by the court which gave the decision, to modify the specifications of the patent, restricting their terms and by implication abandoning the general claim to the exclusive use of cyanide.*

The patents in the Australian Colonies, owned by another subsidiary concern, the Australian Gold Recovery Company, were in 1895 amended in a similar way. The process has been little used and chiefly in an experimental way in the colonies of the Australian mainland, but quite recently its introduction on an extensive scale has been begun in the New Zealand mines. As we have mentioned already, the Australian patents were amended so as to limit their scope in some degree; they have never, we believe, been passed upon by the courts in any of the colonies.

The patents for Mexico were sold for a large sum to a company organized for that purpose, but so far very little has been done there. The process has lately been introduced in some of the mines of the Colar gold-field in Mysore, India, where the tailings from the mills are treated in very much the same way as in the Transvaal.

In this country the Gold and Silver Extraction Company, of Denver, another branch of the Cassel Company, owns the patents, but they have never been actually enforced, though the process has been, and is, in use in different places. The first company to use it on a considerable scale was the Mercur Gold Mining Company in Utah. This company for a time paid royalties to the Denver concern, but afterward withheld them. A suit was brought to enforce the claims of the patentees, but was finally compromised on terms entirely favorable to the Mercur Company. The patents, therefore, have not been judicially reviewed here, but from the nature of the terms made with the Mercur people,† it is evident that the Recovery Company did not anticipate a decision favorable to its pretensions. No other suits for infringement of the MacArthur-Forrest patents have been before our courts.

The comments which have been made on the Transvaal decision in the daily and other journals are in some respects calculated to mislead the public as to its real importance. To correct any such misapprehensions it may be well to state distinctly two points:

1. The decision just given, though final so far as it goes, applies to the South African Republic alone. It is not binding upon the courts of any other country, though it might incidentally have considerable effect upon their opinions.

2. Even if of general effect, the results of the decision would not be so great as some of our contemporaries seem to think. Potassium cyanide is not by any means a universal panacea for refractory gold ores. In many places it has failed to give satisfactory results, and it has nowhere attained so close an extraction as the chlorination process, for instance. In some cases, as in the Transvaal, it has been a very efficient help, but its range of usefulness is limited to certain classes of ores. It may be doubted whether the gold production of the world would have been very much less than it is to-day had its peculiar solvent properties remained unknown, since the use of chlorine, bromine and other chemicals would have taken its place. To say, as one writer did recently, that the use of cyanide opened vast possibilities for increased production of gold all over the world, is simply nonsense. We would hardly consider these articles worth a reference, were it not for the possibility of their misleading many people.

The extent to which the cyanide process has been used in this country and the degree of its adaptability to our ores have already been treated in our columns ‡ very fully on several occasions, and especially in an article so recent that there is no occasion to repeat any part of it here.

After all, the chief effect of the decision will be to cut off a large part

of the revenue of the African Gold Recovery Company, and therefore of its chief stockholder, the Cassel Gold Extracting Company; and by relieving the Witwatersrand mining companies from the payment of royalties, to give them some aid in the reduction of expenses, which many of them sorely need to make.

NEW PUBLICATIONS.

MEMOIRE SUR L'EXPLOITATION DE L'OR EN SIBERIE ORIENTALE. PREMIERE PARTIE; TRANS-BAIKALIE. Par Edouard-David Levat. Paris, France: E. Rouveyre. Pages 200; illustrated.

Mining in Eastern Siberia, especially in the Trans-Baikal, has never been much written about, and but little is really known about it outside of Russia. M. Levat, who is a French mining engineer of high reputation, made a careful examination of a number of the mines in 1895, and has given some of the results of his observations in the present volume. It opens with a chapter giving a general account, historical and geographical, of gold mining in Siberia. The placers of Eastern Siberia were first discovered in 1830; their development was slow and irregular at first, owing to the remoteness of the country and the scanty population. Work is now conducted more systematically, though many of the methods in use are still somewhat primitive, and very little machinery is used. There is still room for great extension in the placer workings, while quartz mining has hardly been begun. In all the Trans-Baikal there are only two quartz mills, the Baian-Zourga mill of 20 stamps with very imperfect appliances, and a 24-stamp mill belonging to the Belogolowski Company, in the valley of the Khangarok, not far from Blagoviestchensk.

The preliminary chapters are followed by full reports on two extensive systems of placers, one owned by the Compagnie de l'Onon, and the other by the Compagnie Daiousskaia. Both systems are treated in detail, and the descriptions and illustrations give an excellent idea of the way in which old mining in the Trans-Baikal is carried on.

The concluding part of the book has several chapters on general topics, including one on the probable origin of the placers; a comparison of the Siberian with the California placers, and several others of interest. Mr. Levat has furnished us with much information on a little-known subject, and much of it is of interest to all who are concerned with mining.

TRANSACTIONS OF THE INSTITUTION OF MINING AND METALLURGY, LONDON. FIFTH SESSION, 1895-96, VOLUME IV. London, England; published by the Institution. Pages 300; illustrated.

The Institution of Mining and Metallurgy is a body which numbers amongst its members many mining engineers and metallurgists whose names are known all over the world, and it is not surprising that the papers published in its *Transactions* should conform to a high standard. They are evidently carefully edited, and in many cases the discussions drawn out by them are of equal value with the paper. The successive volumes are growing into a valuable body of mining literature, the worth of which increases with each year. The present volume covers the proceedings of the Institution from October, 1895, to June, 1896, and includes 18 papers, besides the discussions. Several of these papers are by American authors, and quite a number treat of American mines. No less than three of the papers—by Messrs. James Mactear, T. H. Leggett and R. G. Brown—treat of various aspects of the cyanide process. Among other papers which may be mentioned are "Gold Mines of the Remedios District, Colombia"; "The Mining and Metallurgy of Quicksilver in Mexico," two papers, one on the general subject and one on the Guadalcazar District; "Deep Shaft Sinking in the Lake Superior Copper District;" "Ore Deposits of the Malaga Serpentine, Spain;" "Shaft Sinking by the Poetsch Freezing Process," and "Estimating and Sampling Ore Reserves on the Witwatersrand." It is not possible to review the papers given in detail, though several of them are well worth it. The address delivered by Mr. Joseph Garland, president, at the annual meeting is an excellent review of the recent progress in the different departments of mining.

The Institution certainly justifies its existence by the issue of such volumes of *Transactions* as the present one; and so long as it is in the hands of the present managers it may be trusted to maintain its reputation.

MCNEILL'S MINING AND GENERAL TELEGRAPHIC CODE. By Bedford McNeill. American edition. New York; The Scientific Publishing Company. Pages, 807; thin paper, 8vo. Price, \$7.50.

This new American edition of McNeill's well-known code, brought out by the Scientific Publishing Company as sole agents for the United States, is gotten up in a form which will recommend it to all users. The paper is thin and hard and the binding, in flexible covers, is strong, so that it will stand any amount of hard usage.

As to the merit of the McNeill system itself little need be said, since it is universally recognized as the very best and is already widely used. All telegraphic codes have the same purposes—to save costs in telegraphing, to ensure secrecy in confidential correspondence, and to avoid liability of error. This particular system meets these three requirements in a superlative degree. As to condensation, we have examples of 16 necessary words condensed into 2 words, 32 to 2, 38 to 3, and even 88 to 2, in all of which cases there were no superfluous words in the translated messages. For secrecy, which is often so important in mining transactions and other financial matters, ample provision is made by allowing for pre-arranged variations in the system and the use of substitution code words.

The author, who is thoroughly conversant with the needs of mining engineers, metallurgists, civil engineers and their clients, has included, one would think, about all the phrases likely to be needed. The financial side of mining, the needs of financiers generally, negotiations for effecting the sale or purchase of mineral and other properties, as well as the requirements of stock exchange transactions, legal, banking and general phrases, are all provided for in the 44,000 phrases in the body of the code, to which are added others for numerals, measurements, weights and currencies.

One of the special features of this code is a schedule embracing the

*See *Engineering and Mining Journal* for November 9th, 1895, page 437; November 16th, 1895, page 462.

† See *Engineering and Mining Journal* for March 21st, 1896, page 293.

‡ See especially *Engineering and Mining Journal* for June 9th, 1894, page 533; and for October 24th, 1896, page 386.

less, continue to do so. The road improvement question in fact excites more interest each year as experience in the work is gained, and taxpayers begin to realize the substantial benefits derived from better highways. This demand is becoming of considerable importance to many quarries, which are enabled in this way to dispose of the small stone and trimmings which would otherwise be regarded as waste. It is becoming quite usual to find a stone-breaker for road metal part of the equipment of a quarry. Not every stone makes good road material, but most of the limestones can be used to advantage, and there are many granites and granitic rocks and some sandstones which answer the purpose very well, and make a good and lasting road. The work to which we now refer is entirely outside of the requirements for streets of heavy traffic in the large cities, where the granite block pavement is still the main reliance in this country.

In the East and Middle West, where stone is usually obtainable near by, the Macadam, Telford and other forms of crushed-stone roads are most usual. In many parts of the West shale brick has come into use for town and village streets, though it has been little used in the East. When made of suitable material it gives excellent results, and its manufacture is steadily increasing.

The recent decline in the price of silver appears to be only due in very small part to the result of the elections in the United States, since the speculative interest in the metal dependent upon that result really dropped some time ago. At present there is little or no speculation in the metal, and the current prices seem to be based upon considerations affecting the actual demand. There are several causes which seem likely to affect this unfavorably for a time. Japan is taking very little silver and will not be a heavy buyer for some time to come. The demand from China is light, owing to light exports and also, in some degree, to the fact that the collection of duties on foreign imports in that country is to be made in gold, a measure made necessary by the heavy interest obligations on the Russian and other loans which must be paid in gold. India is poor, owing to crop failures, and for the balance of the year will be an exporter rather than an importer of silver.

On the other hand there will probably be a considerable demand from Russia, as that country has undertaken to coin a large quantity of silver rouble and half-rouble pieces as the first step toward substituting metallic for the present paper currency. Russia produces hardly any silver, and must buy nearly all she needs for this purpose. The quantity will not be sufficient to make up for the loss in the Eastern demand, but will assist the market. France has also undertaken a considerable coinage of silver for Tonkin and her new possession of Madagascar. Upon the whole, we cannot expect any advance over the present price, but at the same time no considerable fall need be anticipated.

Pig Iron Production in the United States.

It was generally supposed that pig-iron production in the United States had reached its lowest probable level in September, and toward the close of that month the tendency to restrict production and put furnaces out of blast seemed to be checked for the time. Contrary to this expectation, however, the October reports showed a still further decrease, and the month opened with the smallest number of active furnaces that has been recorded since the first break after the panic of 1893. Estimated in the usual way, by the weekly capacity of furnaces in blast, production was going on at the rate of only about 6,000,000 tons per year. This was a most marked contrast to the opening of the year, when the output was at the rate of 11,500,000 tons annually; and it showed very plainly the extent of the depression in the iron trade.

This diminished production still seemed to be quite up to the current demand, and there was even a slight increase in the unsold stocks of iron, though this began to disappear later in the month. The falling off was quite evenly distributed among the different classes of iron; forge and foundry iron sales were limited to the immediate requirements of consumers, which were not large anywhere, and the call for Bessemer pig was so light that at one time the furnaces of the Mahoning and Shenango valleys were nearly all idle, and the ore-piles on the docks at Lake Erie ports grew steadily in size, since arrivals were not balanced by shipments to the furnaces. The high prices maintained by the steel billet and rail combinations helped to diminish the demand for raw material, since manufacturers of finished products were unwilling to run except on positive orders; while the prospects for work in the immediate future seemed so doubtful that the foundries were generally unwilling to put in any stocks of pig iron ahead, notwithstanding the low prices at which their grades could be had. This depth of stagnation was not a sudden check, as in 1893, but a gradual process, the descent being made step by step from the height reached in the short-lived boom of 1895.

The course of production this year and last has been in exactly opposite directions. The following table shows the approximate monthly output in each year for the ten months ending with October, stated in round

figures. The table presents a striking contrast, and shows very clearly the course of the industry.

Month.		1895.	1896.	Month.		1895.	1896.
January	.....	762,500	946,000	June	.....	664,500	691,000
February	.....	641,500	800,500	July	.....	730,000	780,000
March	.....	688,000	882,000	August	.....	781,000	675,000
April	.....	666,500	835,000	September	.....	899,500	633,000
May	.....	664,500	822,000	October	.....	940,500	466,000

As we have noted in some previous months, the Southern blast furnaces, as a rule, kept up their production better than those in any other section of the country, and seemed to stand the strain with less difficulty. They were undoubtedly able to work more closely and to limit their costs better in proportion to the prices obtained than their Northern competitors. The Eastern anthracite furnaces cannot well go below a certain level, and are not now able to compete for trade beyond their own immediate district. The furnaces of Western Pennsylvania and Ohio have had to work through the year with Lake Superior ores and Connellsville coke steadily maintained at the high prices which were fixed at the opening of the year. For several months Alabama forge and foundry irons were placed all along the seaboard, at Cincinnati and Chicago, and even in Pittsburg itself, at lower prices than the local furnaces could meet. The profits on much of this iron must have been very small; but the makers claim that at least there was no loss.

In the early part of October the pig-iron market was generally in a demoralized condition. The pressure to sell was much stronger than the desire to buy, the result being that, while nominal quotations were not reduced, many sales were made at points decidedly below those quotations. As the month advanced, however, confidence in the future of the trade began to increase, and the element of speculation for a future rise entered into the market. Some large purchases of a speculative nature, covering altogether an important quantity of iron for present storage and future delivery, were made. These helped to steady prices, and the shading of nominal quotations gradually ceased.

At the present time there is a decided prospect of improvement. Returning confidence in the future is a very general feeling in the trade. The consumers of pig iron, as a rule, have been carrying very light stocks and any improvement in their business must be followed by immediate buying on a considerable scale. The rate of production is so low that such a movement would very soon clear the furnace yards and bring down unsold stocks to such a point that a general increase in prices must follow. It does not look, however, as if any considerable advance could be more than temporary in its nature. There are plenty of furnaces ready to start up on the first indications of an increasing demand, and the considerable speculative holdings may be brought out whenever a profit can be realized upon them. Under these circumstances only a moderate increase in prices can be held for any length of time and this seems to be the general judgment of buyers.

The Cyanide Patent Decision in the Transvaal.

The final decision of the High Court of the South African Republic holding the MacArthur-Forrest patents in that country invalid, as announced in the *Engineering and Mining Journal* last week, marks an important step in a long and stubbornly contested fight. The Scotch owners of those patents, who are incorporated in Great Britain under the name of the Cassel Gold Extracting Company, and who hold large interests in the various auxiliary companies organized in other countries, have upheld their validity in the courts with characteristic national stubbornness, but not with great success. This Transvaal decision is a severe blow to them, as it is in that country that the cyanide process is in most extensive use for the recovery of gold, and the greatest profits have consequently been realized.

The history of the cyanide process has been so completely given in the *Engineering and Mining Journal* and in *The Mineral Industry** that it is not necessary to repeat it here. It has been well established that the facts which are at the basis of the process—that solutions of cyanide of potassium are solvents for gold and that a dilute solution of cyanide can be used to extract the gold from certain kinds of refractory ores—were known long before MacArthur and Forrest took out their patents. It is upon this that the present decision is based. It is of interest to note that much of the testimony in the case was given by American experts and was taken in New York by a special commissioner, acting under authority from the Transvaal.

The special importance of the suits there arose from the fact that in that country the cyanide process first came into general use. The discovery that the low extraction obtained from the Witwatersrand ores by amalgamation in the mill could be in great degree remedied by a supplementary treatment of the mill tailings by leaching with a cyanide solution, and that in this way the earnings of the mines could be largely increased at a comparatively small cost, not only gave a great impulse to

* See especially article on "The Cyanide Process," in Vol. I. of *The Mineral Industry*, pages 239-270; also *Engineering and Mining Journal* for June 9th, 1894, page 533; for November 9th, 1895, page 437, and for November 16th, 1895, page 467.

THE APPLICATION OF SHEET ZINC FOR ROOFING AND OTHER PURPOSES

Written for the Engineering and Mining Journal by W. H. Seamon.

(Concluded from Page 459.)

The following table shows the amounts of material required, and the cost of materials and laying in Europe and New York. The prices given for Europe are the regular list contract prices of the roofing companies for which contracts can be made to-day, when spelter is selling in London for \$3.63 and sheet zinc for \$4.03 per hundred pounds. The New York prices are based upon the selling prices for November 1st, 1895, when spelter sold in that city for \$3.90 per hundred, and sheet zinc for \$5.75; spelter now sells for about \$3. In estimating the cost of laying zinc roofing in New York the European prices for the same work have been taken, and increased 50% to allow for the difference of the prices of labor in the two countries. It will be observed that the rollers of sheet zinc market their product in this country at an advance of \$1.85 per hundred pounds, while the European rollers are willing to accept an advance of but 40c. per hundred. In comparing the cost of zinc roofing with other materials it is believed that fairness to the metal demands an estimate based upon prices near what they should be; we have therefore added a final column for an estimate, based upon an advance of 50% only in labor and rolling, including profits, which we believe can be accomplished in this country.

reaction is not, however, continuous, as the zinc speedily becomes coated with a protecting envelope of insoluble hydrate, destroying the contact of the metal and water, when further action must cease. Unlike some of the other useful metals, the oxygen of the hydrate does not transfer itself, or penetrate to the underlying metal, so that, with the exception of the alteration of this thin pellicle, zinc may be preserved indefinitely in pure water. If chips of zinc are placed in contact with copper turnings in water, the zinc is rapidly attacked, hydrogen being evolved. If the water contains impurities, such as saline substances, the zinc is more rapidly attacked, since the hydrate is soluble in such, or acid solutions.

Moist air, deprived of carbonic acid, attacks zinc, but very slightly unless some less oxidizable metal is placed in contact with it, whereby a galvanic couple, with the zinc as the negative pole, is formed. Moist air containing carbonic acid forms a grayish coating of the hydrous carbonate of zinc, which adheres with great tenacity to the metal and becomes harder than the metal itself. It cannot be removed without employing a steel scraper, or moderately strong acid solvents. This coating forms a natural paint or varnish for the zinc, completely protects the underlying metal from further oxidation and constitutes one of the most valuable features of zinc roofs, since no artificial paint is required. If it were not for the small amounts of acid present in atmospheric waters and the abrasion due to their fall and flow over the sheets the roof would be everlasting. The wearing away due to these causes is very slight, as shown by experience and careful observations and experiments. Pettenkoffer

COST OF ZINC ROOFING.

Style of roofing.	Size of sheets.	Number of clips, per sheet.	Gauge of zinc.	Weight per 100 sq. ft. including clips.	Cost of materials in Europe.	Contract prices for materials and laying in Europe.	Present cost of materials in New York.	Estimated cost of laying in New York, including cost of materials.	Estimate of total cost of materials and laying in New York by development of industry.
Ordinary roll cap.....	36 in. x 96 in.	{ No. 1, 2 No. 2, 6 No. 3, 1	No. 13 No. 14	133 lbs. 115.5 lbs.	\$5.36 6.26	\$8.37 9.26	\$7.65 8.37	\$12.15 12.87	\$10.48 11.05
Patent roll cap.....	36 in. x 96 in.	{ No. 1, 2 No. 13, 5 No. 3, 1	No. 13 No. 14	138 lbs. 151 lbs.	5.56 6.68	8.57 9.08	7.93 8.68	12.43 13.18	10.71 11.29
Patent double ribbed.....	30 3/4 in. x 51 1/2 in.	7	{ No. 13 No. 14	140.5 lbs. 155.5 lbs.	5.66 6.27	9.30 9.91	8.11 8.86	13.57 14.34	10.82 11.50
	Distance between each pair of ribs, 13 in. Number of sheets per square, 7.44								
Tiles, square.....	{ 13 3/4 in. x 13 3/4 in. 23 1/2 in. x 23 1/2 in.	No. 10, 1 No. 11, 2	No. 13 No. 13	185.5 lbs. 159 lbs.	8.28 6.65	10.45 9.50	10.66 8.62	14.06 12.89	12.21 11.39
Tiles, hexagonal.....	10 1/2 in. x 16 in.		No. 13	188 lbs.	8.33	10.65	10.81	14.29	12.19
Tiles, fish-scale.....	24 3/4 in. x	{ No. 30, 6 No. 4, 4	No. 13	151 lbs.	8.14	12.20	12.22	18.39	15.61
Ordinary corrugated.....	29 1/4 in. x 83 1/4 in.	{ Iron framing No. 26, 6 Wood framing { No. 27, 6 { No. 29, 6	No. 15 No. 15	171 lbs. 175 lbs.	7.23 7.40	9.84 10.10	10.34 10.58	14.25 16.13	11.02 13.00

Examination of the foregoing table shows that the cost of a zinc roof in Europe is about the cost of a tin-plate roof in the United States. The real economy of the zinc roof cannot, however, be clearly seen without comparing the various materials with reference to cost of repairs and durability, as well as first cost. The following table contains estimates, which have been carefully prepared after due consultation with parties familiar with the subject, and while we do not claim that they are absolutely accurate for all parts of the United States, they are nearly so:

	Zinc.	Tin.	Slate.	Gal. iron.	Tiles.	Lead.	Copper
Cost per square, including cost of laying.....	\$11.75	\$3.85	\$10.50	\$5.75	\$12.50	\$21.00	\$30.00
Repairs in 30 years.....	1.15	11.25	3.50	11.50	2.50	.....	.....
Interest, 6% on cost, 30 years.....	21.15	18.75	19.90	11.35	22.50	37.80	54.00
Interest, 6% repairs, 15 years.....	1.00	10.12	3.15	10.35	2.25	.....	.....
Total.....	\$35.05	\$46.87	\$37.05	\$38.95	\$39.75	\$58.80	\$84.00

In the item for repairs for the tin roof we have assumed it would last for 30 years, provided it was painted every two years at a cost of 75c. a square. In some localities it need only be painted every three years. We have not, however, allowed for the soldering of the tin roof, usually necessary, from time to time; this constitutes all of the repairs on zinc roofs. The differences are more marked than the figures indicate, for, at the expiration of 30 years, the tin roof, as well as that made of galvanized iron, must be renewed; the slate roof may, or may not be good for another 30 years, but the zinc roof will be good for 50 more at least. Slate and tile roofs require heavier framings, and this is not included in the estimates.

Physical and Chemical Properties of Zinc.—At ordinary temperatures pure zinc is moderately malleable and ductile; the presence of various impurities greatly lessens these properties, so much so, that commercial zinc may, frequently, by repeated blows with a hammer, be caused to break in the direction of its cleavage faces. The ductility of commercial zinc is increased by subjecting it to regular and high pressure. Zinc is moderately hard; according to Huguéy the hardness is 0.83 that of copper. Its physical properties are greatly modified by heat; at a temperature ranging from 100° to 200° C., it becomes quite ductile and malleable, so that it may be easily rolled into sheets; above 250° C., it becomes exceedingly brittle and may then be reduced to powder by hammering in a mortar. The density of rolled zinc, which is always more or less ductile, varies from 7.003 to 7.191. Its coefficient of linear expansion amounts to 0.0002193. The variations of temperature to which metallic roofs are usually subject in this country do not exceed 180° F.; it is therefore necessary that an allowance for expansion of 1/4 in. should be made in every sheet of zinc 7 ft. in length. This expansion is about twice that for tin-plate and rationally accounts for the peculiar methods of laying zinc roofs. Zinc melts at a temperature ranging from 415° to 484° C., and if heated to a temperature of 942° C., it boils and ignites, burning quite freely in air.

Zinc, when used for roofing, is exposed only to the chemical effects of the ordinary atmospheric constituents. Zinc decomposes pure water with the formation of zinc hydrate and the evolution of hydrogen gas. The

examined a roof at Munich, and found that during 27 years' exposure, 8.88 g. of zinc had been oxidized on each square foot (Bavarian) of surface, of which about one-half had been carried away.* The zinc had been penetrated for a distance of 0.0005 of a meter. From this observation, we find that a roof made of No. 13 zinc would require 400 years for complete oxidation, while one made of No. 18 zinc would require 723 years.

The chief solvents existing in the atmospheric waters are carbonic and sulphurous acids. To determine their effects, we exposed, for 100 days, 10 pieces of sheet zinc, each 1 ft. square, to the action of 5 l. of water, containing 0.5 g. of sulphurous acid and an equal quantity of carbonic acid to the liter. Previous to immersion the plates were coated with the hydrous carbonate by exposing them for some time to the action of the atmosphere. Nearly every day the vessel containing the plates was gently shaken, care being taken to prevent them from rubbing against each other. At the expiration of the period, the amount of zinc dissolved was accurately determined, after the usual methods, and was found to equal 0.2268 g., corresponding to a removal in one year of 0.00030244 m., from which we estimate that No. 13 zinc would require 303 years, and No. 18 zinc 548 years for complete solution in atmospheric waters, containing such large amounts of acids. It is, perhaps, needless to say there are no records of atmospheric waters containing so high a proportion as that named above.

The composition of sheet zinc exerts considerable influence upon its durability when employed for roofing purposes. Commercial zinc is never pure, and the following substances may be found in it in varying amounts: Carbon, sulphur, lead, cadmium, arsenic, manganese, iron, antimony, tin, nickel, cobalt and copper. Carbon always occurs in small amounts and to the usual extent of its occurrence the roofing qualities of zinc are not affected. Sulphur is generally present in small amounts and may occasionally seriously affect the ductility of the metal. It may always be kept to a minimum by exercising ordinary care in the roasting of the ores. The chief injurious effect of sulphur upon the roofing qualities of zinc consists in the fact that the sulphur unites with iron whenever the hot zinc comes in contact with iron, forming a sulphide of iron which renders the zinc cold short. By coating the molds for the spelter with beeswax and chalk this absorption of iron may be almost entirely prevented. Iron is usually a constituent, in some form or other, of the retort charges, consequently some enters the spelter while in the retort. So long as the amount of iron does not exceed 0.13% it is not injurious to the roofing qualities of the zinc; above this amount its effects become visible, and should it rise to 0.25% the spelter becomes hard and brittle, interfering seriously with the rolling of the metal, and later may cause the sheets to break when they are sharply bent.

Cadmium is generally present to some degree, but it exerts no injurious effect until it equals 5%, when it makes the zinc brittle. Lead is generally present; up to 1% or even 1 1/2%, the zinc is benefited thereby. It is customary to add lead until the amount equals 1%, when the spelter is to be rolled. If the amount exceeds 1 1/2%, the zinc does not dissolve, the excess of lead, which collects in spots, forming soft and weak places.

* Jahresberichte, 1856, p. 783.

phrases required when surveying or reporting upon mineral property. Another is the system for transmitting full and detailed monthly reports from mines, smelters, etc., at very low cost, intelligibly and safely.

Taken altogether, I have no hesitation in saying, after a very careful examination of the system and some knowledge of its practical working, that all mining men, engineers, directors of companies, bankers, brokers, accountants, financiers and merchants—in fact, all who have business to transact at a distance—will do well to use the McNeill code. W. A.

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.

Ten's Annual Report of the Commissioner of Labor, 1894.—Strikes and Lockouts, Volume II. Washington, D. C.; Government Printing Office. Pages, from 1376 to 1909.

The Witwatersrand and the Revolt of the Uitlanders. By George F. Becker. Washington, D. C.; *The National Geographic Magazine*. Pamphlet, pages, 20; illustrated.

Manual of Determinative Mineralogy. By George J. Brush and Samuel L. Penfield. New York; John Wiley & Sons. London; Chapman & Hall, Limited. Pages, 306; illustrated. Price, \$3.50.

Sur Les Variations Observées Dans la Composition des Apatites, des Phosphorites et des Phosphates Sedimentaires. By M. Adolphe Carnot. Paris, France; Vve. Ch. Dunod & P. Vicq. Pages, 90.

Sixteenth Annual Report of the United States Geological Survey to the Secretary of Interior, 1894-95. Charles D. Walcott, Director. Washington, D. C.; Government Printing Office. Pages, 910; with maps, plates and illustrations.

Bulletin No. 2 of the Bureau of Mines, Toronto, Ontario, Canada; Report on Anthracite Carbon or Anthracolite. By Prof. A. P. Coleman. Toronto, Ont.; Published by authority of the Commissioner of Crown Lands. Pamphlet; pages, 6.

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.

Mining in Bolivia.

Sir: Statistics of mining in Bolivia should be interesting to you and information to the readers of your valuable paper, especially at the present time, when American manufacturers seem to be waking to the fact that for their own good it is absolutely necessary that they should cultivate closer commercial relations between North and South America. The United States has no consul in this whole country, which is larger than the continent of Europe and in natural resources is one of the richest countries in South America, if not the richest of all.

There is very little known in the United States about Bolivia. I have been informed that it has been impossible to obtain definite information from this country regarding the production of the tin mines. Now the United States is the largest tin-consuming country in the world, and yet its manufacturers buy in England tin produced from Bolivian ore instead of importing it directly. The same may be said of antimony, bismuth and some other metals.

I have tried hard in my own way to draw American capital and enterprise to Bolivia and have spoken over and over again of the immensely rich gold deposits which extend over a country larger than the Western United States. I believe, however, that now we are at last succeeding in drawing attention to this country.

The money made and the marvelous success achieved by adventurous Englishmen in South Africa have seldom if ever been equaled in the world's history, especially when we consider how brief a period has been required for the work. I believe that an opportunity now exists, which, if taken, will enable enterprising Americans to inaugurate even a greater and more successful enterprise in South America.

The news of newly discovered gold fields will shortly become known, and I believe that your readers should hear of it at the earliest date.

SUCRE, Bolivia, Sept. 9, 1896.

F. G. GRAUERT.

THE HISTORY OF THE CYANIDE PATENTS.

We give below a brief summary of the history of the cyanide patents, to which attention has just been called by the decision of the Transvaal courts. This history has been already fully given from time to time in our columns, but is now again presented in a condensed form for convenience of reference. It is, of course, understood that the properties of cyanide of potassium as a solvent for gold—as were those of other cyanides, bromides, etc.—had long been known to every chemist, but the trouble was not so much to get a good extraction of gold from the ore as to obtain the cyanide of potassium at a sufficiently cheap price. This difficulty was overcome by the Cassel Gold Extracting Company, of Glasgow, Scotland, and through its chemists, Messrs. MacArthur and Forrest, this company was satisfied that what is called commercial cyanide of potassium could be produced at a low enough price to use it profitably in the extraction of gold from ores, or even from tailings containing only a few dollars of value per ton.

The Cassel Gold Extracting Company was started in January, 1885, for the purpose of purchasing certain patent rights for extracting gold. The paid-up capital was \$800,000, a large amount of which was available in cash. In December, 1887, no dividend had been paid and the directors had discovered that the patents were absolutely worthless, with the result that Mr. MacArthur was negotiated with for his patents. In 1889 there was still no dividend paid, but the capital was increased to \$750,000, all paid in. In 1892 we find the capital increased to \$1,200,000 and the

profits commenced, first, by the sale of the American patents for \$2,000,000, payable in shares of the American Gold and Silver Extraction Company of Denver; second, by the sale of the patent rights for South Africa to the African Gold Recovery Company for the sum of \$100,000 in cash and \$325,000 in shares; third, by selling the Australian rights to the Australian Gold Recovery Company for \$100,000 in cash and \$65,000 in shares. After this the Cassel Company sold patent rights for the Republic of Mexico and other countries, always taking care to get some cash down, and out of the proceeds of these sales large dividends were paid. The South African company, as we have elsewhere noted, was the most successful of the branches, owing to the conditions of the gold industry of the Transvaal.

The American company, which paid \$2,000,000 for the American rights, has never been able to collect much revenue, and in place of paying dividends has hardly been able to keep itself alive. The only suit instituted was against the Mercur Mining Company, of Utah, which was finally compromised on very easy terms, as told in our columns at the time.

ABSTRACTS OF OFFICIAL REPORTS.

Eureka Consolidated Mining Company, Nevada.

This company has continued working its mines at Eureka, notwithstanding the low price of silver. The ores have always contained gold and lead enough to yield a profit. For the year ending September 30th last the report shows the following receipts: Sales of ores, \$35,590; sundry receipts, \$14; balance from previous year, \$8,365; total, \$43,969. The payments were: Tribute ore, jiggings, etc., \$12,723; ore freight to Salt Lake, \$12,131; sampling, \$399; mine expenses, \$5,547; general expenses, Eureka, \$3,682; expense account, San Francisco, \$6,761; total, \$41,243. This leaves a balance of \$2,726 forward to new account. The company intends to continue development work on such a scale as the cash in hand will permit.

The superintendent reports that there were shipped during the year to Salt Lake smelters 1,874 tons of ore, of which 1,812 tons were tribute ore, 16 tons company ore from the mine, and 36 tons material from the old furnace dump. The old tunnel which was in 195 ft. on the west side of the hill, has been extended to 592 ft. on contract. This will enable new ground to be worked and the shipments increased.

Consolidated California & Virginia Mining Company, Nevada.

The brief report of the superintendent of this mine, submitted at the annual meeting of the company, states that for the 12 months ending September 30th, 1896, there was extracted from the 1,600, 1,650 and 1,750 levels of the mine 7,059 tons, 1,430 lbs. of ore, from which was produced bullion of the assay value of \$311,333, of which \$108,306 was gold and \$108,027 was silver. The coin value of the bullion was \$160,686. The ore showed an average yield of \$29.93 per ton. The superintendent reviews at length the prospecting and other work done during the year on the 1,000, 1,600, 1,650 and 1,750-ft. levels of the mine.

Referring to the so-called burnt district, and the gas troubles therefrom, he says: "On June 9th gas was discovered escaping from the south end of the old stopes on the tenth floor above the 1,750 level. This trouble started from some point in the old stope south of our openings, which was inaccessible. In order to stop the inflow of gas we closed the south end of the opening from the 1,750 level by filling the open slope space from which all the ore had been extracted with fine rock and applying enough water to saturate and dampen the ground and old timbers throughout this part of the mine. South from the old Consolidated Virginia shaft water was turned into the old drifts and crosscuts on the 1,500 and 1,650 ft. levels. This water has since percolated through the closed drifts and crosscuts where men could not go, and has undoubtedly reached the point where the fire started, as we have had no further trouble from escaping gas since June and July. The origin of the fire from whence the gas came is unknown, but I am convinced that it was caused by ground pressure continually crushing and splintering the stope timbers, creating an intense heat, which caused the dry timbers to ignite."

"The water," the superintendent goes on to say, "has risen 10½ ft. in the C. & C. shaft during the past year, and is now up to a point 9½ ft. below the shaft station floor of the 1,750-ft. level. The Sutro Tunnel connection with this shaft is 10½ ft. above the 1,750 level sill floor."

Referring to the old stopes from the eighth of the 25th floors above the 1,750-ft. level in the northern part of the mine, the superintendent says that the fillings or ore found within these stopes have all been worked with profit. Considerable ore from these old stopes remained to be extracted.

A British Record of Pig-Iron.—Recently, according to English exchanges, a blast furnace at the Wellingborough Iron Works, Northamptonshire, achieved the output of 716 tons in a week, which is said to be the largest output yet accomplished in the Midland district. The furnace is 66 ft. high and 19 ft. bosh. It is so constructed as to provide for the insertion of bosh cooling plates without a stoppage. The temperature of the blast is 1,400° and the pressure from 5½ to 6 lbs. at the engine. There are nine tuyeres with 5-in. nozzle, all fitted with water jackets. The fuel used is mostly soft coke with some admixture of coal. The ore is ordinary Northamptonshire, and the slag averages 28 cwt. per ton of iron made.

The New Simplon Tunnel.—This tunnel, which will pass under the massive rock of Monte Leone, from Brique, in Switzerland, to Isella, in Italy, will be 19,731 m. in length, and attain at its highest point an elevation of 705.20 m. above the level of the sea. The chief difficulty to overcome is the temperature, which in the interior rises to 40° C. There will be two tunnels running parallel with each other at a distance of 17 m., the first to be finished completely, and to occupy an ordinary broad-gauge line, while the second will for the present only constitute a gallery, with a view to its being enlarged into a second tunnel when the traffic may demand it in after years. The motive force for construction will be furnished at Brique by the Rhone, and at Isella by the river Divera or Caisasca.

Arsenic and antimony injuriously affect the rolling qualities of zinc; fortunately these elements are seldom found in appreciable quantities in spelters of American manufacture. Tin may occur to the extent of 1% without injury, but this seldom, if ever, occurs. The same may be said of copper, although 0.5% of this metal will seriously injure the quality of the rolled zinc.

The following analysis, made under my supervision, represents what may be regarded as the ideal composition of a spelter for making sheet roofing zinc, as the sample was obtained from the largest roofing concern in Europe: Iron, 0.023; lead, 0.708; antimony, 0.175; arsenic, 0.006; sulphur, 0.022; carbon, 0.016; cadmium, 0.017; silicon, 0.002; zinc, 99.031 (by difference).

The question naturally arises, Is American spelter well fitted for the manufacture of sheet zinc for roofing purposes? To obtain this information samples were secured from nearly every smelter working on Missouri ores, and each carefully analyzed under my personal supervision. The results are given in the following table:

	1.	2.	3.	4.	5.	6.	7.	8.	9.
Lead.....	0.531	0.6295	0.6725	0.4105	0.8723	0.3963	0.5875	0.3765	0.2513
Cadmium.....	0.0056	trace	0.0011	trace	trace	trace	trace	trace	0.0188
Arsenic.....	0.0353	trace	none	trace	none	none	none	none	trace
Iron.....	0.0095	0.0315	0.0546	0.0523	0.9233	0.0283	0.0357	0.0399	0.0475
Nickel.....	trace	none	none	none	none	none	none	none	none
Sulphur.....	trace	trace	trace	trace	0.0601	trace	trace	trace	none
Bismuth.....	none	none	none	none	none	none	trace	none	none
Antimony.....	none	trace	none	trace	none	none	trace	trace	none

Examination of this table and careful comparison with the analyses of foreign spelters used for roofing zinc, clearly establish the possibility of making good roofing zinc from American spelters, as now produced.

Other Uses of Zinc.—Zinc is largely consumed, particularly in the United States, for galvanizing sheet iron and wire, of which the former is employed for roofing and building purposes and the latter for fencing. Some zinc is consumed in the Parkes process for the desilverization of base bullion. A large quantity is consumed in the fabrication of brass, and for the production of many other useful alloys small amounts are consumed. The metal toys made in France and Germany are composed of zinc or an alloy of that metal. The larger portion of the spelter manufactured in Europe is converted into sheet metal, of which the bulk is applied to roofing purposes, for wall-facings, for facing dormer windows, for cornices, gutters, down-falls, flashings, etc. Sheet zinc is also applied to sheathing vessels, replacing copper and yellow metal at much saving in cost. Rolled sheets of considerable thickness are suspended in heaters and boilers to diminish incrustations. Rolled zinc can be chased, punched or stamped into useful and ornamental forms of great beauty, and in this form it is used in Europe for the construction of ornamental ceilings, mouldings and friezes for interior decorations. It is also largely consumed for lining refrigerators and packing cases, intended to preserve costly fabrics and articles from damp and moisture. Water cans, buckets, soap dishes, washboards, oil cans, watering pots, stair treads, stove rests, sash bars and coal scuttles are made of sheet zinc, while bath tubs are commonly lined with it.

In the art of zincography, so much employed in the preparation of illustrations, zinc plates specially prepared are employed. Heavy plates of zinc are required by paper makers for glazing purposes. Burial cases are frequently lined with sheet zinc and sometimes they are entirely constructed of the metal. The metallic foundations for cloth and linen buttons are now almost entirely made of stamped sheet zinc.

Zinc is also well adapted for ornamental castings, as it takes very sharp impressions of the most delicate lines of the molds. Many of the beautiful statuettes seen in parlors are composed entirely of zinc, subsequently plated with silver or copper. The sheet metal is sometimes used for cemetery monuments, the joints being soldered, but the results have been far from satisfactory. Under the designation of "white bronze," metallic monuments cast from spelter are now achieving great popularity in the United States. The sand blast is employed to give to their surface a pleasing dull finish. Such monuments are claimed to be more durable than those of stone and are more susceptible of artistic treatment. Zinc may be drawn into wire, ranging in diameter from 0.019 in. and upward. The wire does not possess great tensile strength, but it is sufficient for use in nettings, fencings, clothes lines and for tying up vines and plants. Both cast and rolled zinc is used for electrical purposes, particularly in galvanic batteries.

A Possible Use for Carborundum.—A German writer suggests that carborundum could well be employed as a source of silicon in the manufacture of steel, as it is soluble in molten steel. The cost might be an objection.

Power from Niagara in Canada.—The government of the Province of Ontario, Can., has granted the Mather Bridge and Power Company a franchise allowing it to develop power from the current of the upper Niagara River, between Fort Erie, Ont., and Buffalo, N. Y.

Minerals in India.—The production of petroleum in India is almost entirely confined to Assam and Burma. The Burma oil wells last year produced 19,000,000 gal.—a considerable increase over any previous year—but in Assam the already small production decreased. The import of petroleum into India last year was 53,500,000 gal., against 86,500,000 the previous year. Salt is the most important of all the mineral products of India; last year it amounted to 1,069,000 tons, which considerably exceeds the average for the past five years.

Men Employed in the Lake Superior Iron Mines.—Mine Inspector Trestrail, in his report for the year ending September 30th, 1896, for Dickinson County, Mich., shows 2,578 men employed at the various mines in his district as follows: Chapin, 644; Hamilton, 15; Ludington, 30; Millie, 51; Walpole, 43; Traders, 108; Pewabic, 481; Quinnesec, 4; Cundy, 80; Norway and Cyclops, 37; Aragon, 369; Curry, 108; West Vulcan, 389; East Vulcan, 4; Loretto, 175; Explorations, 40. The production reported, in tons per man employed, was as follows: Chapin, 863; Ludington, 43; Millie, 1,027; Walpole, 46; Traders, 958; Pewabic, 575; Norway and Cyclops, 432; Aragon, 345; Curry, 432; West Vulcan, 344; Loretto, 235 tons.

THE PHOSPHATE DEPOSITS IN MAURY COUNTY, TENNESSEE.

Written for the Engineering and Mining Journal by J. B. Killebrew.

A remarkable discovery has recently been made of thick stratified deposits of the phosphate of lime in Maury County, Tennessee. Like most discoveries this was due rather to accident than to any systematic search. Early in December, 1895, S. Q. Weatherby, formerly judge of the County Court of Lewis County, Tennessee, was passing through Maury County, and when near the village of Mount Pleasant he observed cropping out upon the farm of Scott Jennings a rock formation split up horizontally into very thin layers. He took a piece of the rock, broke it so as to examine its structure, and at once recognized the same granulated appearance that is seen in the phosphate rocks of Hickman and Lewis counties, Tennessee. Samples were submitted to H. I. Arnold, who was interested in phosphate mining in Hickman County. Mr. Arnold sent the samples at once to Lucius P. Brown, an analytical chemist of Nashville, and within 10 days he received the report. The analysis showed 78% of the phosphate of lime. For some weeks no mention was made of the discovery, outside of a chosen few. Mining was begun within the town limits of Mt. Pleasant January 16th, 1896, and from that time the excitement began to grow. Nearly every farmer within 10 miles of the town began to look for phosphate rock on his land. Thousands of excavations were made. In many places the outcrop sufficiently indicated its presence. Stock companies were rapidly organized and development to a greater or less extent was begun. Up to this date there are seven companies at work, besides many individual workers who mine a few tons from their farms or town lots and along the borders of the public highways wherever an outcrop makes its appearance in sufficient thickness to work.

The whole area, containing the phosphate rock in workable quantities, is embraced within 15 square miles, about one-third of which, it is estimated, contains valuable beds, where the phosphate may be easily and cheaply mined. In many places the surface of the country lies below the deposits and in others the beds are covered by high hills. The mining now is confined entirely to those places where the beds of phosphate lie near the surface, and where the stripping does not exceed 2 or 3 ft. of earth. No mining is done by tunneling, nor is any explosive necessary to loosen the deposits.

These deposits of the phosphate of lime occur in what is known as the Nashville or Cincinnati rocks of the lower silurian formation. The phosphate rock deposits in Hickman and Lewis counties, Tennessee, lie much higher geologically. They occur immediately under the Devonian black shale many hundred feet above the stratum carrying the phosphate rock of the lower silurian formation. The geology of these deposits was referred to in the article by State Geologist Safford published in the *Engineering and Mining Journal* for October 31st.

All phosphates, with but few exceptions, found near Mt. Pleasant are highly porous. They occur in regularly stratified beds very persistent, but often interrupted by large blocks of stone, in which the process of leaching is not yet completed. In the beds are found pockets from 5 to 12 ft. deep in which the leaching process has carried away all the carbonate of lime and left a nearly pure phosphate. These pockets are irregularly interrupted near the bottom by the unleached rocks or chimneys, which extend into them in every way—sometimes as thin ledges, sometimes as narrow lines separating the pockets, but there is always a layer of phosphate more or less thick above these unleached rocks so as not to break the continuity of the stratum. The top surface of the deposit follows more or less the contour of the ground, but the bottom is a series of pits filled with phosphates between the block of unleached stone.

When the leaching is perfect the general appearance of the phosphate rock is that of loosely aggregated grains of coarse and fine sand, with easily seen interstices between. It is, in fact, a light and spongy mass of stone something like a pumice stone, easily mined with a pick and spall fork. Its highly granulated structure makes it easily recognizable from all other associated rocks. An exception is found only in the hard, light grayish phosphate found in the Meadows mine, which is very compact, and occurs beneath the soft phosphate. This hard phosphate is from 1½ to 2 ft. in thickness. It has a specific gravity as high as that of the blue limestone. It often shows a central core of a yellowish-red color, as if it had been sprinkled with blood. On each side of this central core is the light grayish stone. A section across the long core resembles the cross-section of an oak tree, with the deeper tints in the center, surrounded by lighter ones on the exterior.

It is said that this hard, compact phosphate has a larger percentage of the phosphate of lime than the softer rock, and that it has less alumina and iron in its composition. The gray rock contains about 82% of the phosphate of lime, and the soft rock from 75 to 80%.

It is curious to examine one of the boulders which has been only partially leached. It will be seen that the outside for a few inches is composed of a layer containing about 80% of the phosphate of lime. The next layer of about 2 in. in thickness is a mixture of about 60% of the phosphate of lime and 20% of the carbonate. The center is of a deep blue color, and is made up of about 50% of the phosphate and 30% of the carbonate of lime. The lines between these are very distinctly marked, there being not the slightest interlacing of the separate qualities.

Where the beds have been thoroughly leached the face of the workings exhibits a series of wavy lines made by the laminations which show very distinctly. The whole face is an exfoliated mass, the number of exfoliations counted in a face of 4½ ft. being 55. In another face of 10 ft. the exfoliations numbered over 100. In such a mass there are frequent vertical fissures that resemble those seen in mining block coal. These fissures make mining very cheap. Oftentimes between two laminae is a soft, coarsely grained, dark brown earth, which becomes very unctuous when rubbed with the finger.

In mining, the mass is thrown down by picks and the spall fork is used to segregate all fragments of a greater diameter than 2 in. The smaller fragments are not considered desirable without being washed, as so much aluminous matter in the form of clay adheres to them as to increase the percentage above the limit allowed and below the limit of 75% of phosphate of lime, upon which basis all contracts are made. This is a guarantee that it shall contain 34.4% of phosphoric acid. From the best information obtainable, I should judge, after examining a number of mines and making a conservative estimate, that the workable phosphate

within easy reach of Mt. Pleasant is contained within 3,000 acres. It has an average thickness of 4 ft., making due allowance for the interference of chimneys. About 15,000 tons have been taken out of the mines up to this date. It is yet too early to estimate with absolute precision the cost of mining this phosphate. It depends largely on the amount of stripping to be done, and the thickness of the seam. Taking all estimates and consolidating them, the cost of mining and putting upon the cars is not far from \$1 per ton. The average number of tons mined per man per day varies from 1½ to 3 tons. This includes the work of stripping also.

The average analysis of many carloads of the phosphate shipped to fertilizer works and analyzed by their chemists, as furnished by Mr. H. I. Arnold, who is connected with the Columbian Company, is as follows: Moisture, 1.50%; sand, 2.25%; phosphate of lime, 78.75%; peroxide of iron and alumina, 2.25%; carbonate of lime, 4%. This would give 36.1% phosphoric acid. All sales are made at a guarantee of 75% of phosphate of lime. The royalty paid to the owners of land for mining privileges varies from 10c. to 25c. per ton. The prices received at present are about \$1.50 per ton f. o. b. cars at Mount Pleasant.

One thing deserves specially to be mentioned, and that is the remarkable uniformity of the product. There is not the slightest difference in the quality taken from the mines when treated alike, with the single exception of the hard gray rock spoken of. No shipment so far has fallen below the guarantee of 75% of the phosphate of lime.

There are now employed in and around Mt. Pleasant from 400 to 500 hands in mining phosphates at an expenditure of from \$600 to \$700 per day, besides those engaged in constructing railroad tracks to the mines from the main line. Four of these tracks are now either building or about to be built.

THE AVERY ISLAND SALT MINE AND THE JOSEPH JEFFERSON SALT DEPOSIT, LOUISIANA.

Written for the Engineering and Mining Journal by A. F. Lucas.

The Avery Island salt mine was accidentally discovered in 1862, while sinking a well, and rock salt was found at about 20 ft. below the surface. Owing to the blockade, salt at that time was a luxury; therefore it was at once utilized by the Confederate government and shipped by teams and rail where most needed in the Southern States. The system then in use was naturally a most primitive one; it answered, however, to supply a sorely needed necessity, until the Federal government put a stop to operations by destroying the pits and works.

Not until the American Salt Company, about 1879, and later on the New Iberia Salt Company of New York, leased the deposit from the Avery heirs on a royalty, was systematic work carried on. The former shipped salt by water transportation through lighters, and the latter by rail from 1883 until July 1st, 1893, when the property was subleased to Messrs. Myles & Co., of New Orleans, La. With the discovery of rock salt in Kansas in 1887 or 1888, the Avery salt mine underwent a heavy decline, and were it not that salt occurs there of an exceptional purity and strength, it would of necessity have declined further to a mere local demand. For the last few years it settled to a steady production of about 30,000 tons yearly. One-fourth of this production goes to the packing establishments of the Northwest as pork and mess beef "capping salt," another fourth is divided between Chicago and St. Louis markets for refrigerating and salting hide purposes, and the balance is utilized to supply the local demand and that of the neighboring States.



AVERY ISLAND SALT WORKS, AND CAVE OVER MINE.

Just now the heretofore almost deserted streets of Mount Pleasant are crowded with men and teams, and there is general excitement. The roads from and to the mines are too narrow for the traffic. Citizens who have occupied cottages in the town for years are finding mines of phosphate under their front yards and are working them. The fine school building recently erected may have to give way for the removal of the heavy deposits of phosphates that underlie it. The population has nearly doubled; the rents have advanced 100%, and 50% has been added to the value of the town property. Lots are being laid off for sale and are to be immediately improved. New stores are being opened, and the business of the old town bids fair to be increased fiftyfold within a year.

German Pig-Iron Production.—The production of the German blast-furnaces in August is reported by *Stahl und Eisen* at 539,440 metric tons; in July it was 539,776 tons, and in August, 1895, it was 490,985 tons. For the eight months ending August 31st the total production was 4,175,021 tons, showing a gain of 376,669 tons, or 9.9%, over last year. The August output was divided as follows: Foundry iron, 76,587 tons; forge iron, 135,903 tons; Bessemer pig, 46,166 tons; Thomas or basic pig, 280,784 tons.

X-Rays Through Glass and Porcelain.—Professor Rücker and Mr. W. Watson find that china not containing phosphates (bone ash) is almost as transparent to X-rays as glass. The object was placed in the path of the rays in thicknesses up to 5 mm., the fluorescence then produced on a screen being compared to a standard light by the color-patch photometric method. The influence of phosphates was expected from the relative opacity of our bones. The researches may lead to results interesting to collectors of china and to chemists. It was noticed during the experiments that fatigued bulbs of too low resistance may be restored by coating the outside with tinfoil, just as too high a resistance can be cured by heating the bulb.

It must be said that in the operations carried on by the American Salt Company first, and their successors later, that the cautious and scientific method of insuring a long life to the mines and an economical product capable of competing with other salt-producing centers and notably the importation from England, was either disregarded or passed over in ignorance of existing facts, for as early as 1883 the first cave occurred. These have since gradually but surely increased in size and number, regardless of many fruitless attempts made to stop further caving, so that the total destruction of the mines in this way is a matter to be expected at any time.

The geological formation of Avery Island is quaternary, while the salt proper is tertiary, which is supposed to be resting on the cretaceous, although this is not yet proved, owing to the great depth of the salt deposit, which has not yet been pierced through. Numerous bore holes by diamond drills were made by the New Iberia Salt Company and recently by Mr. Joseph Jefferson, the eminent actor, at his winter home at Orange Island, as will be described more in detail later.

Avery Island comprises about 3,000 acres of high arable land and rises out of the sea marshes and swamps of the Gulf Coast gradually, forming undulating hills, the highest of which is 180 ft. above tidewater. The sub-soil is a rich loam 2 ft. to 4 ft. deep and underneath it is the drift sand of the quaternary period. This extends clear down to the salt, with occasional mud lumps and clay. The sand belongs to the Port Hudson and Lafayette group and bears ample evidences of the great drift, as shown by quantities of gravel carried from the north; and almost on top of the salt innumerable evidences of fossil mammals, or mastodon, can be yet found. There are also sporadic evidences of lignitic coal to be found, but not of any commercial value. It will be seen by this that no substantial hard roof occurs to insure the salt deposit from the inroad of water, but that it rests directly on top of the deposit, with occasional evidences of hard-pan between.

The mine was unfortunately located in a sink surrounded by hills and of necessity the site selected received most of the natural waterfall over a considerable extent of territory in an almost torrential country. This sink proved to be a treacherous bed of drift sand, and moreover contained

innumerable springs fed by adjacent hills. The American Salt Company sunk a fairly good double-compartment shaft only 90 ft. deep, however, and carried on heavy operations from that depth. It was soon found that original cracks existed in the salt, at such a shallow depth that they were, no doubt, contractions in the process of cooling; these began to be very troublesome on account of the percolation of water through them. Nevertheless operations were carried on, and in a short time a cave occurred of considerable area, which necessitated the abandonment of the east end of the mine. For some time the west end answered very well, when some heavy caving occurred there also, carrying immense amounts of water and sand into the mine. It was then decided to sink the shaft 75 ft. deeper, and a new level was thus opened which gave a new lease of life to the mine. However, the continuous flooding of the upper level with fresh water and pumping out saturated brine caused the opening of new communications between the floor of the upper level and the roof of the bottom level, so that in July, 1895, the lower level had to be abandoned. Operations are now confined in a small area of the old 90-ft. level which can last but a limited time, provided no further cavings occur to stop operations altogether. The New Iberia Salt Company made repeated attempts to sink additional shafts in 1886 and 1887, but after spending considerable money on them, they were abandoned as utter failures.

The system of mining in use is the undercut method, which is a very economical one, and with a deposit of almost unlimited depth could be made more economical still. Chambers of about 80 ft. width are opened out and an undercut run of, say, 7 ft. height and about 200 ft. long. This undercut is the most expensive part of the whole operation. As fast as it proceeds the salt is cleared out, and when a fair distance is reached the roof is attacked by hand drills and salt is shot down to a height of about 20 ft. This salt is cleared out by tramcars and hoisted to the mill, leaving a chamber 80 ft. wide, 20 ft. high and, say, 200 ft. long. When this chamber is cleared of salt the roof is again attacked with the assistance of ladders, with which scaffolds are made for men and machines to get a foothold; a battery of holes is bored and charged with low explosives, ladders and machines are moved away and the salt shot down. On this pile of salt which falls on the floor some shorter ladders are used and the operation repeated until no ladders or scaffolds are further required owing to the increase of bulk, and a height is thus obtained of 60 ft. in the middle and about 50 ft. on each side of the chamber, making a natural arch of solid rock salt capable of sustaining any weight.

The chambers are run 60 ft. apart and parallel with each other and again crosscuts are run, leaving pillars 60 ft. by 60 ft. to hold the roof. By this method, it will be seen that large quantities of salt can be mined at a low cost. None of the arches of the roof have ever given out, except where the fresh water found a way through, cutting the salt like a knife and carrying with it sand; this water increasing in quantities in proportion to the area opened caused the caves above described.

Owing to the great purity of this deposit—from 97 to 99% sodium chloride—the salt is mined, milled and marketed without any treatment whatever. The salt is loaded and hoisted in ordinary mining cars, dumped on top the head-frame, passed through a crusher, sized through a series of screens for coarse grades and the fine is milled through ordinary milling stones. The operation as a whole is very simple and produces from the coarsest capping salt to the finest edible table salt.

THE JOSEPH JEFFERSON SALT DEPOSIT.

Mr. Joseph Jefferson, the veteran actor, purchased Orange Island, La., about 1870, and has made there his winter home uninterruptedly for the last 25 years. The island, now better known as Jefferson Island, contains about 9,000 acres of fine alluvial land. It is bounded on the northwest by Lake Peigneur, and on the southeast by Vermilion Bay. Lake Peigneur is 3 miles long by 2½ miles wide, a most beautiful sheet of water. Mr. Jefferson has a magnificent home on the summit of the island about 80 ft. above the lake overlooking his domains, which were originally stocked with thousands of imported and registered cattle and blooded horses. Besides this, the lake and its surroundings are noted far and wide as a preserve for snipes and wild ducks of all kinds. He made repeated attempts to bore for artesian water without success, yet undaunted by past failures he repeated the attempt in 1894 by giving out a contract to bore down 500 ft. There were many difficulties with this boring, owing principally to an improper outfit and want of skill, until, in the early summer of 1895, salt was discovered at a depth of 235 ft. The writer, who was then superintendent and manager at Avery salt mines for Messrs. Myles & Company, was called in and at once advised the exploration of the deposit by diamond drill. Accordingly an excellent outfit was purchased from the Sullivan Machinery Company of Chicago, and prospecting to locate the deposit began in earnest. Eight holes in all were bored from half a mile to 600 ft. apart and from 150 ft. to 2,100 ft. in depth. By triangulation the exact contour of the deposit was located.

Throughout the borings it was found that the top surface consists of a blanket of rich impervious clay from 60 to 110 ft. thick. Below the clay drift-sand and some gravel were found with occasional strata of hard blue clay and cemented gravel or hard-pan from 4 ft. to 10 ft. in thickness. The drill also passed through some thin seams of lignite of insignificant value commercially, and in one instance, it brought to the surface broken pieces of prehistoric Indian pottery, now in the possession of Mr. Jefferson, which came out of the bore-holes at about 150-ft. depth. It is hard to surmise how the pottery got there; certainly it was not carried there by the drift, as it gave no evidences of travel or worn appearance. The fact, however, remains and no doubt more pottery will come to light when a shaft is sunk. A finer or purer salt deposit is yet to be found on this continent, and it is believed that it will certainly match in time the greatest and purest deposit of the world, at Wieliczka, Poland.

The soundings made by the drill varied from 90 to 400 ft. in depth before salt was reached. In one instance the diamond drill was made to go down in the attempt to pierce the deposit to the depth of 2,100 ft. without success. In this particular hole salt was found at 235-ft. depth, so that there is known to exist 1,865 ft. of pure salt crystals without the slightest appearance of interruption by any foreign substance. It is simply a matter of conjecture to how much further the salt goes down; for every practicable purpose Mr. Jefferson has in

sight salt enough to supply the United States for hundreds of years. The geological conditions in which the salt is found and the experiences at Avery Island salt mines shows that the work of opening a new mine on Orange Island should be entrusted to a careful mining engineer, who must make a critical study of the cause and effects of the failure at Avery Island and then profit by the mistakes there made.

IMPROVEMENTS IN THE ELECTROLYTIC REFINING OF COPPER

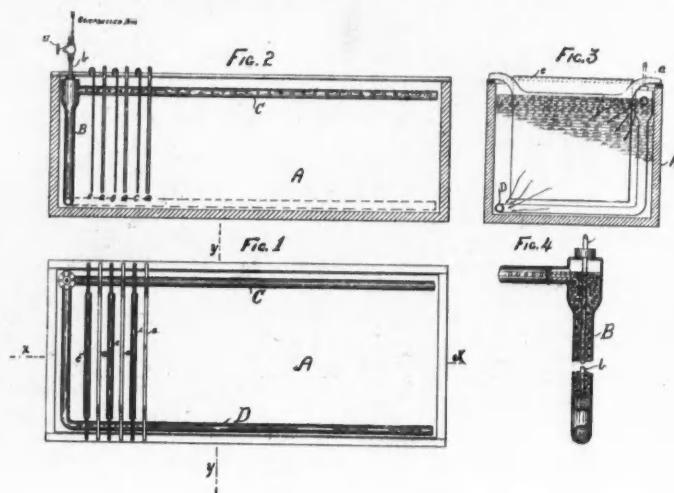
Written for the Engineering and Mining Journal by Titus Ulke.

The recovery of fine copper from roasted ores is achieved by James Douglas, as set forth in his patent granted June 30th, 1896, by a preliminary wet extraction of the ores, so as to obtain copper sulphate, the reduction of the latter to cuprous chloride by means of a chlorine salt and sulphurous acid, and the electrolysis of the moistened cuprous chloride. Against this process might be urged some of the objections that have been raised with regard to the Hoepfner and the Siemens-Halske methods of copper extraction. These latter methods, moreover, have been tested in several works, without giving entirely satisfactory results.

In refining processes by which high-grade or blister copper is treated electrolytically, we note but few radical improvements. Several of the recent patents have for their subject matter the production of complete articles of manufacture, such as trolley wheels, gear pinions, journal-bearings and the like, by electro-deposition inside a mold forming the cathode of the apparatus, while others relate to depositing the refined metal in grooves as strips to be eventually drawn into wire.

The Elmore process of electro-deposition as modified by H. Thofehn, was described in the *Engineering and Mining Journal* of September 19th.

In connection with the question of royalty it is important to note that the system of arranging the plates in series without separate cathodes, known subsequently as the Hayden process, was anticipated by Moses G. Farmer, of New York, in his patent No. 322,170, granted July 14th, 1885. The use of the endless cathode was also first described by Farmer in Patent No. 335,905, dated February 9th, 1886. It is now generally conceded that the multiple arrangement of the plates, with the tanks in series, is more satisfactory than the Farmer or Hayden system. The latter is no longer in extensive use outside of the works of the Baltimore



APPARATUS FOR ELECTROLYTIC CIRCULATION.

Electric Refining Company, and even this company finds the large quantity of scrap copper produced in operating their series system a serious drawback.

As Barnett states in Peters' *Modern Copper Smelting*, the current efficiency of the multiple process averages 95%, as against 90% for the series process under similar conditions; secondly, much less copper is held back in the multiple than in the series system, and, thirdly, the relative cost of operating it is less by nearly \$2 per ton. The greater first cost of works using the multiple system lies in the extra expense of the tank conductors and plates for making cathodes, plus about one-half of the value of the lead lining of multiple tanks, plus one-third the value of the steam and power plants. However, in spite of its larger first cost, the multiple system is undoubtedly susceptible of greater economy than is possible under series arrangements. Considerable weight is lent to this statement by the fact that, after costly and exhaustive experiments with series processes, the Anaconda Mining Company finally discarded them and installed the multiple system.

The present Anaconda refinery contains an ingenious automatic register for controlling the refining operation, which was also described in the *Engineering and Mining Journal* of September 19th last.

The method of circulation now employed in the large copper refinery of M. Guzenheim's Sons, at Perth Amboy, N. J., is of unusual interest. The apparatus adopted was patented by A. F. Schneider and O. Szon-tagh, June 30th, 1896. It consists of two perforated pipes, placed one in the upper and the second in the lower part of the electrolytic tank, and connected at their open ends by a pipe through which, by means of an air lift, the solution is drawn from the tank by the lower pipe and delivered into the upper pipe, to be discharged back into the tank through the perforations of the upper pipe, as illustrated in the annexed drawings. In these Fig. 1 is a plan view of an electrolytic tank with part of the electrodes removed; Fig. 2 is a longitudinal section on the line x x of Fig. 1; Fig. 3 is a cross-section upon the line y y of Fig. 1; Fig. 4 is a sectional view on a larger scale of the air-lift. In these A designates an electrolytic tank; a and c, electrodes; B, a vertical pipe, by preference of

lead, and placed in one corner of the tank; *C* and *D*, perforated horizontal pipes, closed at their outer ends and connected at their inner ends to the vertical pipe *B*, as shown, these pipes being located at opposite sides of the tank, one of them near the top, the other near the bottom thereof. A tube, *b*, of glass, is inserted into the pipe *B*, terminating near its bottom, and connected to any suitable supply of compressed air or other gas, the admission of which may be regulated by a stop-valve, *s*, Fig. 4. When air is discharged through the pipe *b* into the lower part of the pipe *B*, the fluid is caused to rise therein and to flow from the lower part of the tank *A*, through the pipes *D* and *B* into the upper pipe *C*, from which it is discharged back into the tank through the perforations. These perforations of the pipe *C* and *D* are located between the electrodes so as to cause circulation between the latter from the top diagonally to the bottom, as indicated by the arrows in Fig. 3. The perforations are of diameters slightly increasing with the distance from the pipe *B*. Instead of causing circulation of the liquid by an air-lift, other suitable means may be used, such as a pump or a steam injector.

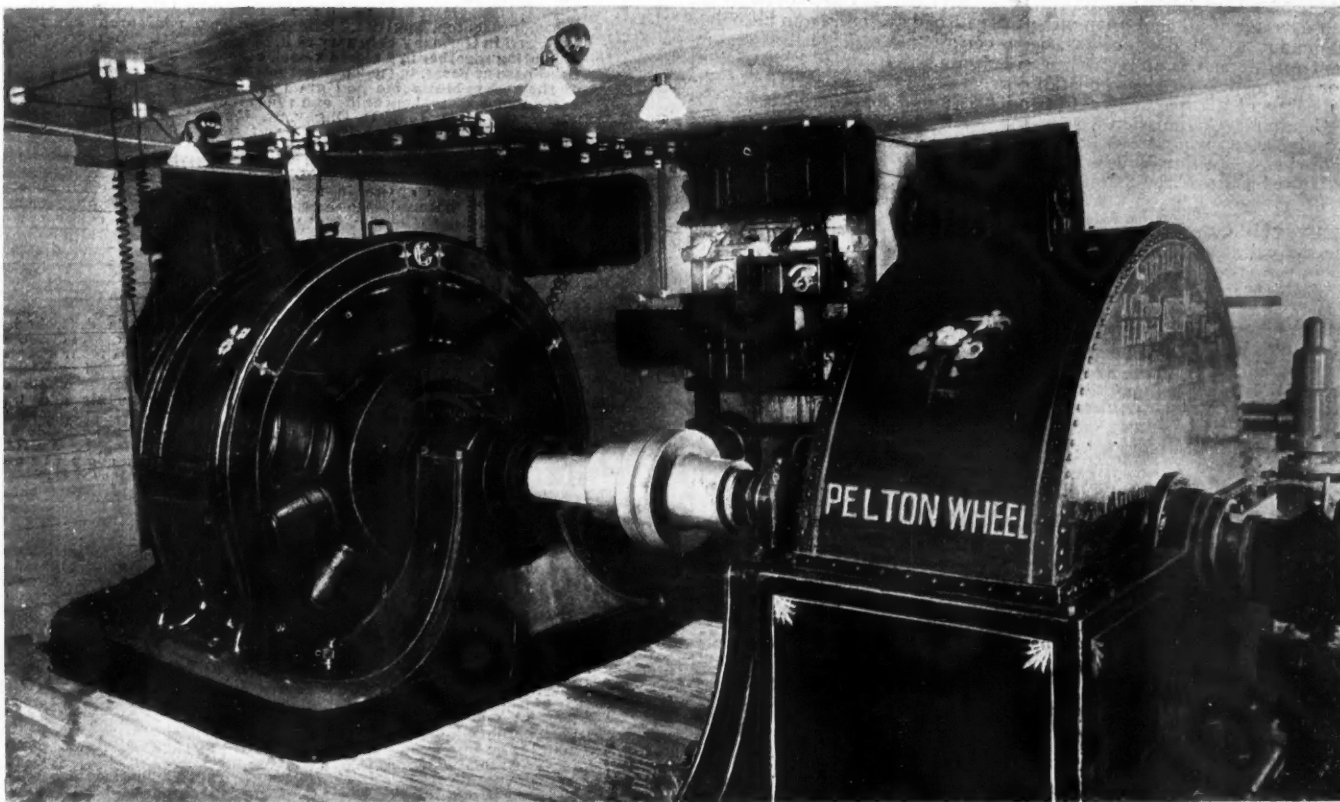
Fundamentally the same apparatus was invented and put into practical use about nine years ago by Messrs. H. & K. Borchers at their copper refinery, near Goslar, Germany, but was not described until recently.* With the Borchers system of circulation, it is (1) no longer necessary to have the electrolyte run from one tank to the following one of a long series. 2. The impurities of one tank are not carried through the whole line, as

NEW WATER-POWER PLANTS.

A power station with some interesting features is located a short distance above the Iron Springs Hotel, at Manitou, Colo., and consists of a 500-H. P. Pelton wheel direct-connected to a General Electric Company's generator. The wheel runs under a head of 600 ft. and is speeded at 600 revolutions. The power thus generated is carried a distance of eight miles and runs an air compressor for supplying the drills, operating in what is known as the Strickler Tunnel, which is being driven through a spur of Pike's Peak. This tunnel is 6,400 ft. long and forms a part of the new water-works system of Colorado Springs. Operations on the tunnel are carried on from both ends, and light as well as power is supplied from the station for the power-house as well as all underground work. The accompanying illustration shows the water wheel and generator.

The 13-in. main supplying Colorado Springs carries a pressure at the reservoir of 170 lbs., which it is now proposed to utilize, by means of Pelton wheels and electric generators, for lighting the city.

In this connection we may also mention that the Pelton Water Wheel Company has recently furnished the Alaska Gold Mining Company, at Douglas Island, Alaska, a wheel of such extraordinary dimensions as to make a brief description of interest. The wheel is 22 ft. in diameter, and is direct-connected to the shaft of a Reidler duplex air compressor, with air cylinders 24 in. in diameter by 38-in. stroke, having a capacity to deliver 2,800 cu. ft. of free air per minute at a pressure of 80 lbs. per



WATER WHEEL AND GENERATOR, ELECTRIC PLANT AT MANITOU, COLO.

each bath works independently of the rest. 3. But little leakage of electric current and no wasteful overflows of liquid occur. 4. The introduction of the air jets into the solution may also affect the partial purification of the electrolyte by forming and separating arsenates of iron or copper, antimonates, etc. 5. One pipe line only is required to fill and to empty the tanks by air pressure and suction. 6. Last, but not least, the current density may be raised to several times that of the old method, which means nothing less than the possibility of turning out several times as much copper as by the old method in a plant of the same size. Altogether the new system of circulation constitutes a most remarkable improvement in electrolytic copper refining.

In conclusion, we must affirm our belief in Barnett's doctrine that it is to the simplification of the electrolytic idea, combined with the most thorough adaptation of plant to its location and accompanied by the closest scrutiny of the refining operation, that we must look for the real means of producing high-grade electrolytic copper cheaply.

Lucium.—As the result of his researches on monazite sand, M. Barrière has discovered, according to the *Chemical News*, a new elementary body which can be utilized for the production of incandescent gas-light; and he has given to it the name of "Lucium." Investigation has shown that while the salts of cerium, lanthanum and didymium form with sodium sulphate insoluble double salts, lucium does not; nor does it, like thorium and zirconium, form these salts with sulphate of potassium. Spectroscopic examination of lucium reveals the fact that its lines slightly approximate those of erbium; but it differs from those in several respects. It seems, therefore, to be a distinct elementary body. Its atomic weight has been calculated at 104.

square inch. The wheel weighs 25,000 lbs. and serves the purpose of a fly-wheel as well as a prime mover. It runs under a water-head of 480 ft. at a speed of 75 revolutions, and develops upward of 500 H. P. A hydraulic speed regulator is attached to the wheel, which controls its movement so that a uniform air pressure is maintained on the receiver. The wheel was made of this large diameter to give proper speed to the compressor under the head in this case available.

This is probably the largest tangential wheel ever constructed and shows the facility with which these wheels can be adapted to unusual and extraordinary conditions. In a case like this the transmission machinery to carry such an amount of power would involve a heavy outlay as well as constant expense in maintenance, besides a material loss of power; a direct connection to water wheel of machinery operated without intermediate gearing is, therefore, of great advantage wherever possible.

The Russian Manganese Ore Trade.—A statement just published shows that the exports of manganese ore from the port of Poti on the Black Sea, in 1895 amounted to 157,175 tons, of which 59,145 tons were for the United States, 62,130 tons for Germany, and 35,900 tons for Great Britain.

Petroleum in South Africa.—Petroleum as an industrial venture in the Transvaal is not being ignored, says the *South African Mining Journal*. The Clocolaan Petroleum Syndicate, a Johannesburg corporation for prospecting in the Orange Free State, has ordered out a first-class cable-drill from America, and looks to hear of its arrival at a Cape port in charge of an experienced man in a short time. The drill is designed to reach 3,000 ft. Mr. C. M. Pielsticker, a well-known exploiter of rock-oil in Europe and America, is preparing to look for petroleum between Rustenburg and Malmani, and there seems every promise of speedy beginning to his operations.

* See Borchers' *Elektrometallurgie*, 1895, and *The Mineral Industry*, Vol. IV., p. 506.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

NATURAL GAS ESCAPING FROM PIPES.—In an action against a natural gas company for death caused by an explosion of gas escaping from its pipes in the street, the company being charged with negligence in permitting its pipes to remain out of repair at a specified point, evidence of defects at other places in the line is admissible, though some of those were not noticed till after the explosion, the evidence warranting a legitimate inference that they existed before.—*Alexandria Mining and Exploring Company vs. Irish* (44 Northeastern Reporter, 680); Appellate Court of Indiana.

BONA-FIDE HOLDER OF NOTE FOR MINING MACHINERY.—H., a mining expert, had for several years bought furnaces of A. and sold them to others in connection with an apparatus of his own for smelting ores. The party of whom he bought did not give him credit, but required either cash or took the note of one buying from H. directly to A. The court held that a note taken on a sale was not taken in payment of a former debt, and that A. was not responsible for the co-operative working of the furnace and the attachment.—*BlueSprings Mining Company vs. McIlvein* (36 Southwestern Reporter, 1094); Supreme Court of Tennessee.

INTERSTATE COMMERCE: COST OF CARRYING COAL.—The fact that the cost of carriage of all coal upon an entire railroad system, from all points of shipment to all destinations, is a certain per cent. of the gross receipts from all coal, is no reason for concluding that upon a particular line or part of the system the cost of carriage bears the same ratio to the coal receipts of that particular line or part; and an order of the Interstate Commerce Commission based upon such erroneous estimate cannot be sustained, and is not to be judicially enforced.—*Interstate Commerce Commission vs. Lehigh Valley Railroad Company* (74 Federal Reporter, 784); United States Circuit Court, Pennsylvania.

DEFINING MINERAL LANDS.—In a recent letter, Mr. A. H. Ricketts, of San Francisco, calls attention to the ruling of the Commissioner of the Land Office in the case of *Aldritt vs. the Northern Pacific Railway Company*, lately decided, in which it was held that the term "mineral land," in the land laws of the United States, refers only to those lands containing metalliferous ores and does not refer to deposits of such substances as rock, chalk, kaolin, gypsum, petroleum, fire-clay and other similar minerals. This decision is very far reaching in effect, and if affirmed by the Secretary of the Interior will prove a source of litigation to all placer claim owners of land containing the minerals named, as well as those containing borax, carbonates or nitrates of soda, sulphur, alum, asphalt, limestone, oil, mica, diamonds, or iron ores where not found in rock in place.

In the course of the opinion the Commissioner says: "Although, as a matter of convenience, the department from time to time allowed entries to be made of mineral substances, such as rock, chalk, kaolin, gypsum, petroleum and other similar minerals, under Section 2,329, Revised Statutes, as placer claims, they were allowed upon a strained construction of the statutes, but whatever views might be entertained in disposing of these lands as placer claims, where they did not conflict with the rights of others, I know of no decision of the department that holds to this construction of the statute when it impairs or defeats the rights of others under the general land laws providing for the disposal of the public domain."

If this construction of the mining law is to stand, it means that possessory rights to such lands must fall before a homestead entry covering such lands, and that even if already they are covered by a mineral patent that such patent may be annulled or declared to be of no effect as evidence of the placer claimant's right to his land, as the issuance of such patent was without the jurisdiction of the Land Department. But this decision may be reversed upon appeal, and the anomalous proceeding of acquiring title to recognized mineral land as agricultural land may be avoided.

Minerals in Samos.—According to a British consular report recently issued there are in the island of Samos several deposits of minerals, the most valuable being antimony and silver lead. There is also marble of good quality. No mines have as yet been worked. Concessions were granted some time ago, but, owing to defaults made by the concessionaries, these have now all been cancelled by the Turkish Government. There is good reason to believe that some of these mines would yield fair results if properly worked.

Cleat in Coal Veins.—The matter of cleat in coal seems to be little understood by some coal-mining men. In many mines entries have been turned from 60° to 90° to get on the cleat. Were it known in Illinois that the general trend of the cleat in bituminous coal is northeast and southwest (about S. 50° W.), shafts could be sunk to advantage. Most scientific men agree that soft coal gives a better yield of lump if worked on the face of the cleat, and all wide work should be on the face of the cleat. Cleat is like the grain in wood, saw it across and we have a yield of blocks, saw it with the grain and it splits up.

Preparation of Titanium.—In a late number of the *Annales de Chimie et de Physique*, M. Moissan continues the account of his researches with the electric furnace. With regard to titanium, M. Moissan has found that with a current of 50 amperes and 50 volts, titanic acid is converted into crystallized oxide of titanium. With 350 amperes and 70 volts, the bronze-yellow nitride, Ti_2N_2 , is obtained. When 1,200 amperes and 70 volts are used, the temperature rises above the point of decomposition of this substance; and the carbide, TiC , is formed, free from nitrogen; and if this is heated with an excess of titanic acid, titanium containing only 2% of carbon is obtained. These successive actions, says M. Moissan, give a decisive proof of the increase of temperature of the electric arc depend-

ent on an increase of the current, and form the starting point of another long series of experiments.

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.

WEEK ENDING NOVEMBER 3D, 1896.

- 570,460. **SEPARATOR.** George W. Cross, Pittston, Pa. The combination with a receptacle, a source of water supply communicating with the interior, means for passing the water through the receptacle under pressure, an inclined perforate way in the receptacle, means for feeding upon the upper part of the way the material to be treated, a guide-partition located in the receptacle above the inclined way and inclined in the same general direction, a discharge at the upper end of the guide-partition for receiving a part of the material separated, and another discharge from the receptacle for the remainder of the material separated.
- 570,466. **STONE-DRESSING MACHINE.** Oliver T. Dutro, Buffalo, N. Y. The combination with the stationary frame having guideways, of a stone clamp or holder, a carriage moving on the ways, a cutter or chisel mounted on the carriage and having a V-shaped notch forming converging cutting edges, and actuating cylinder also mounted on the carriage and a piston arranged in the cylinder and having a rod or hammer arranged to operate against the chisel.
- 570,480. **MANUFACTURE OF CYANOGEN COMPOUNDS.** John J. Hood and Alfred G. Salomon, London, England. Patented in England, March 25th, 1891, No. 5,351, and in Germany February 25th, 1892, No. 72,644. The process consists in heating together in a closed vessel, carbon bisulphide ammonia, and a fixed base or bases, in such proportions that the products of the reaction of the carbon bisulphide and ammonia combine with the fixed base or bases forming sulphocyanide and the sulphide of the base or bases.
- 570,495. **ARTIFICIAL FUEL.** John D. Oliguy, St. Henry, Canada. The method of making artificial fuel consists in first forcing air through a mixture of gas-oil, tar-oil, soda, and cream of tartar, and then incorporating the aerated mixture with combustible absorbent material mixed with lime.
- 570,516. **PROCESS OF AND APPARATUS FOR MAKING GAS.** Levi Stevens, Trenton, N. J. The method consists in forcing the bituminous coking-coal, or carboniferous material, into the center of a gas-generator by mechanical pressure applied to the coal through a magazine, thereby causing an outward and downward pressure on the material in the generator, expelling the gases and causing them to pass through the outer mass of coal. A generator, combined with a central magazine having passage between the magazine and the walls of the generator with a mechanical feeding device, constructed to feed the coal under pressure to the magazine and generator.
- 570,540. **HYDRAULIC AIR-COMPRESSOR.** Joseph H. Champ, Cleveland, O. Assignor to the Bishop & Babcock Company, same place. The combination with a main-valve chamber having a water connection with the air and water chamber, and a primary-valve chamber, of a water channel between the two valve-chambers, such channel being independent of the water connection between the main-valve chamber and the air and water chamber.
- 570,554. **ELECTRO-DEPOSITION.** Eduard Jorda, Munich, Germany. Patented in England, June 8th, 1895, No. 11,293, and in France, June 8th, 1895, No. 248,008. The process consists in preparing a bath containing a compound of the metal to be deposited with an acid radical of the series $CnH_{2n}O_2$, excepting carbonic acid, and then precipitating the metal from the bath by an electric current.
- 570,621. **PROCESS OF MAKING CHLORINE.** William Donald, Saltcoats, Scotland Assignor of one-half to Robert Main, Stevenston, Scotland. Patented in England May 30th, 1895, No. 10,713. The process consists in treating, under heat, an alkaline chloride and manganese oxide with nitric acid and water, peroxidizing and recovering the manganese by roasting the residual product dissolving in water, blowing in air and finally separating the manganese oxide by deposition.
- 570,712. **METHOD OF AND MEANS FOR PRODUCING LEAD OXIDE.** James Noad, London, England. Patented in Belgium, May 7th, 1895, No. 121,232. The process consists in subjecting lead, in a molten condition, in a closed lead-melting tank, to the combined influences of water and air injected or fed thereinto, while the mass of the metal and the surface are kept in turbulent motion. The means consists in a lead-melting tank connected by a hood with a series of depositing-hoppers and a condenser, and fitted with an agitator adapted to keep the mass and the surface of the molten metal in turbulent motion, and with means respectively serving to direct jets of water and of air on to the molten metal.
- 570,745. **ORE PULVERIZING MACHINE.** George A. Cleveland, Providence, R. I. Assignor of one-third to Edgar G. Durfee, same place. The combination of an outer cylindrical casing having inwardly-extending teeth or pins secured thereto, a revoluble inner cylinder mounted within and concentric with the outer cylinder having radially-extending teeth adapted to travel in circular paths and at the same time passing between and co-acting with the teeth of the outer cylinder, an enlarged feeding chamber or head formed by the continuation of the cylinders, a mechanically-operated feeding device communicating with the feeding-chamber and a suitable hopper or reservoir, whereby the material or ore is conducted from the latter into the feeding-chamber, and a stationary head or member, communicating with the rear end of the cylinders, into which head the material is discharged.
- 570,780. **MINER'S SAFETY LAMP.** Thomas H. Williams, Mount Carmel, Pa. The combination of a lamp body, an inverted cup having an aper ure in its bottom and formed at its lower end with an outwardly-extending flange screwing into the body, a sleeve having a beveled or tapered exterior surface and formed with a flange at its lower end to engage the bottom of the cup, the sleeve extending through the aperture in the cup and adapted to form a passage for the wick tube, and a locking device held on the cup to engage the sleeve.
- 570,781. **COAL SEPARATOR.** Charles W. Ziegler, Scranton, Pa. The combination with the supporting frame, frames secured thereto, the transverse stationary cylinders located in different vertical planes, the perforated plates secured to the frame, and the short imperforate plates upon which the plates rest, of the adjustable slides located in front of the cylinders forming openings or passages therebetween.
- 570,831. **DRY ORE CONCENTRATOR AND SEPARATOR.** Robert E. Waugh, Eugene Waugh and Charles S. Older, Colorado Springs, Colo. Assignors of nine-twentieths to Jesse S. Waugh and William E. Hitchcock, Omaha, and Merriweather J. Waugh and Fremont A. Warren, Lincoln, Neb., and N. C. Robbins, St. Louis, Mo. The combination of the endless apron, the end drums or rollers therefor and the frame supporting the rollers and apron, the main frame, a shaft journaled thereto and having a crank connected with the apron frame, a gear on the crank, a gear on the apron frame and meshing the gear on the crank and connections between the gear on the apron frame and the apron drums or rollers whereby to drive the apron.
- 570,843. **ORE SEPARATOR.** Henry M. Copland, Scottsburg, Ore. The combination with a rocking frame supporting a hopper, of two riddles, the upper one of which inclines downward from the head of the frame to the lower end thereof, and the other from the head of the frame to a point about midway of the length of the upper riddle.
- 570,876. **CONVEYING APPARATUS.** Augustus L. LeGrand, Pittston, Pa. Assignor to the Exeter Machine Works, same place. The combination of a pair of horizontal horizontally-swinging upper and lower conveyor-troughs, the upper of the troughs being provided in its bottom with screens whereby part of the material introduced therein at any point will be screened into the lower trough, and a flighted conveyor having the upper and lower portions thereof traveling respectively in the upper and lower troughs.

PERSONAL.

MR. WILLIAM M. GIVEN, civil engineer, has left Adel, Ga., for Cocoa, Fla.

MR. OSCAR LACHMUND, of Idaho Springs, Colo., was recently appointed assayer and chemist at the De Lamar mines in De Lamar, Nev.

CAPTAIN THOMAS COUCH has tendered his resignation as manager of the Boston & Montana Company's mining properties in Montana.

MR. ERNEST E. PAYNE, of College Point, Long Island, has been appointed superintendent of a gold property in the State of Zacatecas, Mexico.

MR. M. CHAUVENET, of the firm of Chauvenet Bros., chemists and engineers, St. Louis, Mo., is at present in the West examining mining properties.

MR. FRANCIS MUIR, of London, president of the De Lamar Mining Company, Limited, has been in De Lamar, Idaho, looking over the company's property.

MR. WILLIAM HAMILTON MERRITT, mining engineer of Toronto, Ontario, has been spending some time in British Columbia, where he has investigated a number of properties.

MR. CHARLES HARBORDT, metallurgist, of the Compañia Metalurgica Mexicana, San Luis Potosi, is now connected with La Gran Fundicion Central Mexicana, Aguascalientes, Mexico.

MR. EDWARD STEWART, for a long time the superintendent of the Ajax Mining Company's property in Juab County, Utah, has gone to Idaho to take charge of the Union Mining Company's workings.

MR. HAMILTON SMITH, who represents the Rothschild mining interests in this country, has left New York for the West. He will stop in Chicago for a few days, and then will go directly to Anaconda, Mont.

MR. O. C. HART, who for a long time has been assayer at the Gilt Edge mine in Fergus County, Mont., has resigned his position, and will in future be in the same capacity at the Spotted Horse mine at Maiden, Mont.

MR. MARCUS DALY has been re-elected resident manager of the Anaconda Copper Mining and Smelting Company for another year by its board of directors, having charge of their works and mines in both Anaconda and Butte, Mont.

MR. C. ADOLPH THIES, of the Haile mine, North Carolina, has been spending some days in New York. Mr. Thies informs us that he withdrew from his connection with the Royal gold mine in Georgia in July last, and that his son, Mr. A. C. Thies, who had charge of the chlorination plant at the Royal mine, also resigned his position in October.

MR. M. OSHIMA, technical director of the government steel works in Japan, arrived in San Francisco this week. He is accompanied by four Japanese engineers, and purposes visiting the leading steel works in this country and Europe before returning to Japan, and will also purchase the necessary machinery for a large steel plant.

DR. F. W. IHNE, mining engineer of Chicago, recently completed examinations on three mining properties, one in Arizona, one in California and the third in Colorado. The properties are gold and copper. It is understood that Dr. Ihne has made the examinations in the interest of a German syndicate, and that the reports have been so satisfactory that the syndicate will shortly buy the properties mentioned. The deal, if it goes through, will represent over a million dollars.

MR. R. G. MCCONNELL and MR. JAMES McEVOY, both of the Geological Survey, have returned to Montreal, Canada, from the mining fields of British Columbia, where they spent the summer in field explorations. Mr. McConnell left Ottawa in May, and first visited the Saskatchewan oil district before going on to British Columbia. Since June he has been in the southern part of West Kootenay, in the Rossland and Nelson mining districts. He spent considerable of the summer around Rossland. Mr. McEvoy spent the first part of the summer in the Shuswap District, although he was with Mr. McConnell the latter part of the season.

OBITUARY.

CHARLES H. MASON, for many years in charge of the Pratt Division of the Standard Oil Company, in Brooklyn, N. Y., died there November 2d, aged 82 years.

LUCIUS P. HUNT, aged 81 years, who died November 1st in Massachusetts, was a native of Huntsville, Conn. His ancestors were for generations in the iron business, owning ore beds of iron in Lime Rock, and the pig iron from their blast furnaces was known throughout the country for its purity and excellence. Mr. Hunt removed to Bridgeport in 1856 and later was connected with iron works in New Hampshire.

TERENCE BRODIGAN died at Oakland, Cal., October 30th, aged 72 years. He was one of the oldest mining men in the State, being one of the original owners of the Comstock Lode. Mr. Brodigan went to San Francisco from Ireland in 1850, later to

Tuolumne County, to Nevada in 1859, where he purchased the whole of Gold Hill for a few hundred dollars. The greater part of the capital required for the preliminary development of the Comstock Lode when it was discovered was furnished by him.

JACOB ZIEGLER DAVIS, aged 76 years, died at Philadelphia, October 30th, while on his way to Europe for his health. Mr. Davis was one of California's pioneers, reaching the Pacific coast in 1849. He accumulated a large fortune, making his start in placer mining on the Yuba River in partnership with Alexander Boyd. The deceased was a member of the Society of California Pioneers and of the Academy of Sciences and was president of the State Mineralogical Society. To both of the latter he donated valuable collections.

WILLIAM DANIEL ALLEN, chairman of the firm of Sir Henry Bessemer & Company died in Sheffield, England, October 24th. Mr. Allen was chiefly notable for his association with Sir Henry Bessemer during the whole of the time when the latter was experimenting with the celebrated Bessemer process of steel manufacture. The process was first put into operation in a commercial form at the Bessemer Works in Sheffield, under the management and control of Mr. Allen, Sir Henry Bessemer being one of the partners in the firm. The partnership expired in 1877, when the concern was turned into a limited company, of which Mr. Allen was chairman up to the time of his death. In 1890 the Iron and Steel Institute conferred upon him the Bessemer medal for effecting improvements in the Bessemer process. Mr. Allen was also the inventor of the Allen agitator for the better mixing of steel. He was 72 years of age.

HENRY A. MOTT, well known throughout the United States as a chemist and engineer, died at his home in New York City on November 8th. Dr. Mott was born at Clifton, Staten Island. He graduated from the Columbia School of Mines in 1873, taking the degree of Engineer of Mines and Bachelor of Philosophy. He then took up the question of technical chemistry. His exposé of the adulteration of baking powders with alum is still well remembered. Dr. Mott was often called before the courts as a chemical expert. In 1881 he became the professor of chemistry of the New York Medical College and Hospital for Women.

Among his well known works are "The Air We Breathe, and Ventilation," "Was Man Created?" "The Chemists' Manual," "Chart on Food," and "Matter, Ether and Energy." For three years Dr. Mott was employed by the United States government as chemist and examiner of the food purchased by the Indian Department. He was a member of many foreign and American scientific societies, and was the chemist of the New York Medicolegal Society, before which he read many papers.

SOCIETIES AND TECHNICAL SCHOOLS.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—A meeting was held November 2d, at which Mr. H. H. Vaughan, M. E., of the Great Northern Railway Company, led a discussion that was suggested by incidents of a recent visit to the shops of that company by 14 members of the society. These shops are equipped with laboratories for mechanical and chemical tests, and pneumatic appliances are in general use in the various departments.

POLYTECHNICAL SOCIETY OF CHICAGO.—At the annual meeting of this society, which is a member of the National Association of German-American Societies, Dr. F. W. Ihne, of Chicago, was elected president for the fourth time. Engineers representing the firms of Fraser & Chalmers, Siemens & Halske Electric Company and the Western Electric Company, all of Chicago, were elected to vacancies in the Board of Directors.

ENGINEERS' CLUB OF ST. LOUIS.—The 42d meeting was held November 4th at 1600 Lucas Place.

MR. M. L. HOLMAN presented informally the proposed specification and form of contract prepared by the Board of Public Improvements for the lighting of the streets, alleys and public places of the city of St. Louis for a term of 20 years, beginning in 1900. The most important features of the proposed contract were the exclusive use of 32 candle-power incandescent lights in place of the arcs of 2,000 nominal candle-power, all wires to be under ground. The adoption of the incandescent light to the exclusion of the arc is the result of a careful investigation into the illumination given by the two systems. The arc lights give a very unequal distribution, the illuminations being very intense at one point with but little light midway between. The incandescent lights, on the other hand, are placed much nearer together and afford a much more uniform light.

AMERICAN CHEMICAL SOCIETY.—The regular meeting was held November 6th at the College of the City of New York. The papers read were as follows: "Volumetric Determination of Acetone," by Dr. E. R. Squibb; "Notes on a Chemist's Trip Abroad," by C. A. Doremus; "A New Form of Pycnometer," by J. C. Boot; "Improvements in the Colorimetric Test for Copper," by George L. Heath; "Note on the Solubility of Bismuth Sulphide in Alkaline Sulphides," by George C. Stone.

A detailed review was given in Dr. Squibb's paper of the method employed by Robineau and Rollins for the volumetric determination of acetone.

This method consists in mixing acetone with a solution of potassium iodide and sodium hydroxide, and then transforming it into iodoform with a titrated solution of a hypochlorite. Dr. Squibb has introduced various modifications to shorten the work so as to render the process available commercially.

The paper presented by Dr. Doremus was quite interesting, mentioning as it did the scientific meetings held in London and Paris, last summer, and the various English and Continental laboratories visited; among them were those connected with the large manufacturing establishments. Mr. J. C. Boot exhibited and described a specific gravity bottle, designed to prevent the rapid alteration of the temperature of the liquid and consequent difficulty in making accurate weighings, when the temperature of the laboratory happens to be much above the standard temperature at which the liquid must be weighed. The essential point is the inclosure of an inner by an outer bottle, the space between being quite thoroughly exhausted.

The next meeting will be held December 11th, at Stevens Institute of Technology, Hoboken, N. J.

MICHIGAN MINING SCHOOL.—The catalogue of this institution for 1896-1898 has been issued. It is a very complete work of its kind, containing 238 pages. Besides the usual school statistics, cuts of buildings, outlines of courses, etc., the volume contains a number of tables giving the classification of rocks and minerals which students taking the course in geology, mineralogy and petrography find very valuable in their class and laboratory work, as well as helpful in their future researches in those lines. The scope of the work done and the methods employed in this department of the school are well outlined by these classifications. The catalogue contains also various statistics concerning the mineral production of the United States, and of Michigan in particular. Mention is made of the equipment and work of many of the most important copper and iron mines in the Upper Peninsula. The location of the school in the midst of productive mines makes possible weekly excursions to these mines and mills, which is a part of the student's work; also an annual trip to the more remote iron mines, enabling him to study and compare the plans of work employed.

The storage battery plant donated to the school last year by Hon. J. M. Longyear is now being set up. In connection with this work Edgar Kidwell, Professor of Mechanical and Electrical Engineering in the school, has developed an automatic circuit make and break switch designed especially for use with storage or accumulative plants. The enrollment this fall is the largest since the organization of the school, there being now 111 in attendance. This increase is no doubt largely due to the favor with which the elective system is being received, which method is believed to be the one best suited to the needs and conditions of the institution.

INDUSTRIAL NOTES.

The Virginia Coal and Iron Company has fired up 50 new coke ovens at Upton, Va.

The Pennsylvania Bolt and Nut Works, at Lebanon, Pa., have resumed work with 1,500 men.

The Colorado Fuel and Iron Company started its plant at Pueblo on November 9th, with 1,000 men.

The Clinton Furnace Company at Pittsburg, Pa., started up in full on November 10th with 300 men.

The Crane Iron Company, at Catsaunaga, Pa., will blow in another stack to fill several large orders.

The Knoxville Iron Company's mills at Knoxville, Tenn., have been started and nearly 1,000 men have been given work.

The Pottstown (Pa.) Iron Company has fixed up one of its puddle mills and two rolling mills, and is preparing for further resumption.

The East Lake Glass Factory, at Bridgeton, N. J., put fires under its pots November 7th, and has begun to make a melt preparatory to going to work.

The San Francisco (Cal.) Glass Works, which have been closed down for many months, have resumed operations, giving employment to about 250 people.

The West Superior (Wis.) Iron and Steel Company has been given orders by Receiver Howard Morris, of Milwaukee, to start the foundry department.

The Ford City Plate Glass Works, in Armstrong County, Pa., which have been idle for several months, will resume at their full capacity on November 16th.

The North Carolina Steel and Iron Company's furnace at Greensboro was put in blast for the first time on November 5th. Ore for its use comes from nearby mines.

The Phenique Chemical Company, of St. Louis, Mo., has increased its capital stock from \$50,000 to \$100,000. The capital paid up is \$45,000, the assets are \$109,376, and the liabilities, \$7,715.

No. 1 Colebrook furnace, at Lebanon, Pa., owned by the Lackawanna Iron and Steel Company, of Scranton, has been undergoing repairs, which are

to be completed at once, and the furnace put in blast.

The Britton Rolling Mill Company, of Cleveland, O., manufacturers of tin plate, whose plant has been idle for some time past, announce that they have just closed a large contract and will resume shortly with 150 men.

The Hollidaysburg Iron and Nail Company and the Eleanor Iron Company, of Hollidaysburg, Pa., and the Portage Iron Company, of Duncansville, and the Altoona Iron Company, of Allegheny, resumed operations in all departments November 9th.

The Paxton Rolling Mill Company at Harrisburg, Pa., has begun the erection of a flanging plant, which will give employment at the outstart to quite a number of men, in addition to those employed in the other departments of the company's works.

The Penn Steel Casting Company, of Chester, Pa., cast the largest ram, or stem post, this week that has ever been cast in this country. It is for the Newport News Ship Building Company, and is to be used in the battleship *Kearsarge*. The casting will weigh over 70,000 lbs.

The Chisholm, Boyd & White Company, Chicago, reports the shipment of a complete outfit of machinery for bricking flue dust and fine ores to Lima, Peru, for the Backus & Johnston Smelter and another to Aguascalientes, Mexico, for the Guggenheim Smelting Company.

The Ironton Fire Brick Works and the Parker & Austin Fire Brick Works, both located at Coal Grove, Ky., opposite Ashland, have resumed operations. The Ashland Steel Company's plant and the Norton Nail Works are both actively engaged in preparations for resuming work.

The Taylor, Vaughan & Taylor Company, of Cuyahoga Falls, O., is working night and day making machinery for a wire-nail mill, which will occupy the old wire mill at Cuyahoga Falls. It will furnish work for a large number of men. Cleveland capitalists are interested in the new enterprise.

The Star Tinplate Works at Pittsburg, Pa., which has been running half time, started up in full with two additional mills on November 9th, giving employment to 100 skilled workmen. The Oliver Iron and Steel Company, also at Pittsburg, started the plant in full on November 11th, employing 600 men.

The Buhl Steel Company, of Sharon, Pa., has awarded the contract to the Lloyd-Booth Company, of Youngstown, O., for building all the firm's machinery for the New Open-Hearth Steel Company, of Sharon. The contract was let for \$50,000. It will require about four months to complete the new machinery.

The Boston Bridge Company's 4-story building, on Sixth street, Cambridgeport, Mass., was totally destroyed by fire on November 7th. Shortly after the fire started there were a number of terrific explosions of oil used for heating rivets and other parts of iron, and the burning oil scattered the flames to every portion of the building. The loss is about \$163,000.

The Berlin Iron Bridge Company, of East Berlin, Conn., has received an order from the Glens Falls Paper Mills Company, of Glens Falls, N. Y., for a new Pulp Mill, at Cadyville, N. Y., including water tower and boiler-house. The latter company has also placed an order for additional buildings for their Kent's Falls plant, consisting of a pulp mill, boiler-house, barker-room and wood-room.

The Birmingham (Ala.) Rolling Mill has resumed operations with 1,200 employees, and the Gate City Rolling Mill, with 800 men. Arrangements have also been made to start the Bessemer Rolling Mill, which has been idle for a long time. The Howard Harrison Iron Pipe Works at Bessemer, the largest in the South, have put a full force of men at work, and the Alabama Pipe Works at the same place have received orders sufficient to put on a full force for some time.

TRADE CATALOGUES.

The Walker Company, Cleveland, O., manufacturers of electric machinery for mining, railway and lighting purposes, devotes circular No. 1017 to the subject of switchboards and instruments.

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.

OIL PRODUCTION AND NEW WELLS.—According to the monthly statement of *Derrick*, for October, 1896, the number of new wells completed in the

New York, Pennsylvania and West Virginia oil fields amounts to 581, having a daily production of 8,669 bbls., and there are 914 new wells drilling. In the Buckeye field, 279 new wells were completed during the month, with a daily production of 5,355 bbls., and 360 wells were under the drill at the end of the month. In the southeastern Ohio district, there were completed during the month, 43 new wells, having a daily output of 594 bbls.; the number of wells at work on October 31st was 65. The new wells completed in the Indiana field for the month aggregated 58, with a daily production of 1,515 bbls., and the wells drilling were 79.

CALIFORNIA.

AMADOR COUNTY.

(From Our Special Correspondent.)

ONEIDA.—The shaft at this mine, two miles north of Jackson, is down 525 ft. and progressing favorably, and it is the intention of the management to sink from 1,500 ft. to 1,800 ft. before opening up the mine. The new 500-H. P. double direct action steam hoist has been placed in position on a concrete foundation. This hoist, which has a 20 in. x 60 in. cylinder, reel for flat rope and all the modern attachments and appliances, was furnished by the Union Iron Works of San Francisco. An 80-ft. galloway frame has also been erected. The ledge in the old workings of this mine, which showed from 4 ft. to 10 ft. in width, yielded large quantities of low-grade ore and some very rich ore. The 60-stamp mill was run steadily.

CALAVERAS COUNTY.

DONALDAN.—Hackett, Thompson & De Golyer have paid \$17,000 on the bond on this mine, and put up a 15-stamp mill. There is a large body of low-grade ore, 300 ft. wide in one place, carrying \$4 in free gold.

(From Our Special Correspondent.)

SHEEP RANCH.—This mine, in the town of Sheep Ranch, 17 miles east of San Andreas, we learn on good authority is about to be reopened and an electric plant installed which will furnish ample power to free the mine from water and carry on work to advantage. This mine produced \$4,000,000 in 16 years, the mill never stopping a day during that period. The pay chute was 1,200 ft. in length and the 11 levels produced \$350,000 each. Large quantities of specimen rock have been sold to jewelers and others, thousands of dollars being realized from this source. Some time ago the wood supply ran out during the winter when no hauling could be done, and the mine became flooded to the depth of 1,200 ft. and has been closed down ever since. The wood consumption for steam power was one of the heaviest expenses, being about \$30,000 a year.

UTICA.—The report that this famous mine, at Angel's Camp, had been sold to Colorado capitalists for \$6,000,000 has been denied by one of the owners.

FRESNO COUNTY.

(From Our Special Correspondent.)

The excitement at Coalinga, 45 miles southwest of Fresno, quieted down on the receipt of a dispatch by the Producers and Consumers' Oil Company, of Fresno, who own numerous petroleum claims there, stating that the Department of the Interior had granted a rehearing of the petroleum lands decision. Under the terms of that decision, namely, that petroleum lands are not mineral lands, scores of valuable claims at Coalinga have been jumped and the owners have shown a disposition to resist by force of arms.

KERN COUNTY.

(From Our Special Correspondent.)

The traffic between Mojave and the Randsburg and Goler mines is very large. It is estimated that 4,000 head of stock are employed to do the hauling. A mill is to be erected at Cuddeback's Dry Lake to crush ore from these mines. There is water enough to run 20 stamps.

COMPROMISE.—This mine, four miles southwest of Tehachapi, in the Tehachapi Mountains, is reported to have been sold to Hugh McDonnell and James Sallee for \$50,000. The ore is said to yield \$11 per ton, worked by an arrastra. The property has been worked by three inclines to a depth of 125 ft., and about 1,500 tons of ore are blocked out. Machinery is being shipped to the mine and development work is to be carried on extensively.

MARIPOSA COUNTY.

RIVERSIDE.—J. J. Casey and James Walsh, who owned a half interest in this mine, on the North Fork of the Merced, 12 miles distant from Coulterville, have disposed of their interest in the mine to Mont. Gilbert, an oil speculator of Gibsonburg, O. S. D. Landecker, who owns a one-half interest in the mine, has bonded his interest to Mr. Gilbert, who will at once commence active development work on the property. Recently a very rich deposit was uncovered, the rock carrying quantities of coarse gold.

NAPA COUNTY.

GREAT WESTERN QUICKSILVER MINING COMPANY.—This company held its annual meeting November 5th. Directors were elected as follows: G. Palache, M. P. Jones, E. W. Newhall, James T. Whitney, Edgar N. Wilson, Edward R. Diamond and James Palache. G. Palache was elected president, M. P. Jones vice-president, A. Halsey secretary and H. M. Newhall & Company treasurers and agents.

NEVADA COUNTY.

ORLEANS.—Superintendent Brckington reports that he has passed through the hard bar at this mine and struck a stringer of fine ore in the 700-ft. level, which promises to develop into a fine chute. This is the first gold-bearing ore discovered below the 200-ft. level.

SHASTA COUNTY.

GLADSTONE.—This mine has cut the old ore chute at a depth of 900 ft., and struck 3 ft. of \$25 ore. An effort is being made to settle liens and claims against the mine and to resume operations.

SISKIYOU COUNTY.

SISKIYOU CONSOLIDATED QUICKSILVER MINING COMPANY.—This company held its annual meeting on November 5th, when the following directors were elected: William B. Buckminster, Frank W. Sumner, Leopold Klau, Ray T. Kimball and Bethnel M. Newcomb. William B. Buckminster was chosen president, Leopold Klau vice-president, Edward F. Stone secretary and Haas Brothers treasurers and agents. The work in the mine during the year has been wholly confined to sinking the main shaft and prospecting the ground.

(From Our Special Correspondent.)

CALIFORNIA QUICKSILVER MINING COMPANY.—This company is still prospecting for the ledge in their cinnabar mine near Garretson's Springs, or Beaver Creek.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

APP.—Owing to the fact that the Tuolumne Water Company has been compelled to shut off 75% of the water supply of this mine, on Quartz Mountain, near Jamestown, the mill has shut down. The hoist and pumps are still operated, the dump is being cleaned out and underground development continued.

BLACK OAK.—This mine, three-quarters of a mile southwest of Soulsbyville, has shut down owing to the lack of water. This mine in the lower levels has a 12-ft. vein. The rock carries considerable iron, zinc, lead and copper sulphurets and pyrrhotite. The cyanide plant is not proving a success. Other mines in this district are reducing their working force on account of the small water supply.

COLORADO.

BOULDER COUNTY.

MORNING STAR.—This mine's new plant at Ward has been successfully started up and 30 men are employed underground in development work and breaking down ore. The company recently purchased the mine for \$65,000 and has spent \$20,000 in improvements in and upon the property. Another \$20,000 is yet to be spent in additional equipment. Last year the Morning Star produced nearly \$100,000, but with the superior facilities employed by the company now operating the mine this record will probably be exceeded.

PACTOLUS HYDRAULIC MINING COMPANY.—During the past summer this company dug a ditch with a capacity of 60,000,000 gals. per day to work 7,500 cu. yds. of gravel every 24 hours from which the estimate return is placed at 37c. per cubic yard. The placers extend 8 miles. Last year's production will inadequate appliances was \$150,000.

WARD-ROSE.—This mine, at Ward, is owned by C. L. Davis, F. W. Davis and F. S. Dowd. A vein of ore was recently struck in the property, from which a shipment of several tons was made, and the smelter certificates received show the ore to have run \$136.13 to the ton.

ZERO.—An assay received by J. N. & A. J. Jingles, owners of this load, on Left Hand, from an average sample of ore from the vein in the bottom of their 60-ft. shaft, gave returns of \$9 in gold, 173 oz. silver and 3% lead.

CHAFFEE COUNTY.

ROCKY MOUNTAIN MINING AND MILLING COMPANY.—Two carloads of machinery have arrived for this company, at its claims, about a mile and a quarter east of Granite, consisting of a 25-H. P. double friction hoister and a 20-H. P. single-friction hoister. The former will be used on the Yankee Blade and the latter on the D. C. Campbell, a contiguous property.

Mr. Charles Parker has had a lease and bond on the Yankee Blade for more than a year past, and has interested with him Mr. Clarence Richardson, of Cheyenne, Wyo. They have already placed a hoister over a 75 ft. shaft about 150 ft. west of the main shaft. This shaft is in excellent condition, having recently been cleaned out and retimbered. It follows the vein which has a dip to the north of about 80°. It will be sunk in virgin ground, being west of the old workings. It is expected that this shaft will drain the old shaft and drifts. There are three distinct parallel veins on the Yankee Blade within a space of 75 ft. The Rocky Mountain Company, organized with a capital stock of \$200,000, with Clarence Richardson, Charles Parker and Leopold Kabis as the Board of Directors, has purchased the Parker mill and machinery and the leases formerly held by the Granite Gold Mining and Milling Company. The capacity of the company's mill will be increased from 20 to 50 tons per day.

CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

CARBON.—The owners of this claim, at Lawson, are doing considerable prospecting through an adit,

and at the breast the streak is well mineralized. They have found float at the surface which assays very high in silver.

COLORADO CENTRAL.—All of the levels in this Georgetown mine, with the exception of the one at 1,000 ft., are being driven, in all of which mineral is reported to be showing. Superintendent Arnold has everything arranged for a vigorous winter's work.

CROWN POINT-VIRGINIA.—A suit has been brought in the Federal Court at Denver, against the New York company operating this property near Idaho Springs, to recover on notes given George A. Kessler, its former owner, and which were transferred to Samuel Roberts. The suit is for \$14,744.38. The property is a valuable one and from a personal investigation I can say that the lead is one of the best in Clear Creek County, but the New Yorkers refuse to put up money to either pay for the mine or to pay for its development. They require the management to gouge out all of the ore to pay the expenses and also think that enough ore should come out in development to pay for the property.

GEM.—Mr. W. E. Renshaw, operating this mine at Idaho Springs, has opened up a big body of smelting ore in the lower level. On account of poor air he has been driving the level westward to a connection with the Gem-Extension claim, and when completed the two claims will be consolidated. Aside from 15 in. of \$100 ore, there is 24 in. of high-grade concentrating, which will be treated at the Mayflower mill.

REPUBLICAN.—Work has been started on this group of claims at Empire, and it is claimed that a full force of men will be placed at work now that the election is over.

SILVER HORN.—There is no question but that Mr. L. McLeau, an Idaho Springs photographer, has struck a good thing in his Ute Creek property. A sack sample of mineral tested by J. J. Elliott returned 54 oz. gold and 300 oz. silver per ton. The adit has been driven 300 ft., and the present showing just came in near the breast.

SILVER STANDARD.—An adit is being driven on this lode at Georgetown. The heading is in ore that mills 280 oz. silver per ton.

SUN & MOON.—At a depth of 160 ft. the mineral streak in this Idaho Springs claim has widened and now shows 3 ft. of solid lead ore. It is one of the biggest things on Seaton Mountain. The Cleveland owners are sinking and drifting.

TENTH LEGION.—Three sets of leasers are working in this mine, at Empire. Ore is showing throughout the various levels, and shipments of smelting ore are going out by the carload, the ore just made returning \$100 per ton. One hundred tons of mill dirt is also being treated at one of the concentrators.

COSTILLA COUNTY.

PIASA BIRD COMPANY.—This company, operating on Sand Creek in the Duncan District, has cut a large body of low-grade ore in one of its properties, which has been worked for the past six months. The ore is very similar to the Creede ore.

EL PASO COUNTY.

ALPHA MINING COMPANY.—This company, which owns claims at West Creek, is figuring on starting up work on the Sarah J.; \$2,000 worth of work has been done on this property. An offer of \$4,500 has been made for 300,000 shares of the stock.

TOPEKA MINING COMPANY.—This company has let a contract for 100 ft. more depth on the U. and Eye lode, at West Creek. The shaft is now some 60 ft. deep and is located at the junction of two leads.

EL PASO COUNTY—CRIPPLE CREEK DISTRICT.

(From Our Special Correspondent.)

ANACONDA.—This mine, on Gold Hill, is increasing its shipments rapidly, the output last month having been 1,500 tons, a great portion of which was sent to the Florence Works. On this property there is more than a mile of development, the tunnel alone having been extended 3,500 ft. from the mouth. It is rumored that there is enough money in the treasury to pay the stockholders the 5c. assessment voluntarily levied in 1893, that was necessary at that time to save the property from being sold by the sheriff.

BRODIE CYANIDE MILL.—Last month this mill treated 1,556 tons of a gross value of \$33,134 and of a net value of \$19,982. The Pearce Turret Furnace is doing well, and the tailings from the roasted ores are equally as low in value as the tailings from the oxidized ore. This is the first mill which has roasted its ores in using cyanide solutions, and last month (the first month) demonstrated its success.

C. O. D.—At this mine, in Poverty Gulch, they are sinking the shaft with all speed below the 350-ft. level. The dam recently built to stop the flow of the water has been eminently successful; the water in the shaft is about 20 gals. a minute.

ELKTON CONSOLIDATED.—The output for October was 49 cars, with the net earnings therefrom of \$32,000. In the treasury there is a balance of \$130,000. The mine is doing well.

EL PASO REDUCTION WORKS.—These works, at Gillette, during the month of October treated by chlorination 1,300 tons of ore of a gross value of \$30,000. It is stated that the capacity of the mill will be doubled, as there is generally 1,000 tons of ore in the bins.

ESTERLINE.—This mine, on Howel Hill, is being vig-

orously worked by Messrs. C. Y. Hall & Company, under lease and bond. A shaft has been sunk 300 ft., and at that depth a crosscut was driven west 35 ft., where the vein was found which at the point of intersection was 3 ft. wide, but without value. The lessees in driving north found the vein increasing in width, and it is now largely quartz and fluorite, showing a very material change in the character of the vein from that seen at the 175-ft. level.

HAYDEN PLACER.—The block numbered 22, within the city limits, has been leased to Mr. Thompson, who in a 20-ft. shaft has found a vein which assayed for 4 ft. wide and \$18 per ton.

HULL CITY PLACER.—This is now a scene of activity; the 40 acres are being leased into blocks of 300 ft. square, and shipments have already been made. The Johnson Lease has made its second shipment from its 120-ft. shaft, the first shipment netting \$40 per ton, and the second shipment a little over \$80 per ton. Three steam hoists have been erected on the placer, and there are rumors of others going up at once. This ground has been in conflict for three years.

I. O. O. F.—This claim, on Howel Hill, is being worked under lease and bond by a Mr. Smith. The shaft has been sunk 150 ft. and shows a well-defined vein between granite walls. A small seam of telluride was recently found.

KEYSTONE.—This mine, on Gold Hill, under lease and bond to Messrs. Fogleman & Smith, has recently confined all operations to the driving of a north drift at the 110-ft. level.

LITTLE MAY.—Shipments from this mine, on Beacon Hill, average 15 tons of ore a day from the 90-ft. level, of an average grade of \$16 per ton without sorting. The vein is 18 ft. wide, all of which is mineral. The mine is wet, water pouring out from the north drift. The property is worked under lease and bond of \$75,000 by Judge Burvis, of Cripple Creek, who will in all probability take up the bond long before it is due.

LUCKY GUSS.—This mine, on Bull Hill, steadily increases its output, which for October was 230 tons of \$40 ore, or a gross output of \$9,000. The mine employs 42 men.

MOON-ANCHOR.—This mine, on Gold Hill, shipped about 200 tons for the month of October, making a gross output of \$10,000. The shaft has not been sunk for several months, but is 420 ft. deep. The work is largely carried on at the 300-ft. and 400-ft. levels. The number of men employed is 46.

PHARMACIST.—This property, on Bull Hill, shows splendidly, and the debt will soon be liquidated. At present the mine is being worked under many disadvantages, but as soon as the new shaft is "holed" to the slopes at the 250-ft. level the mine should again resume the payment of dividends.

PRINCE ALBERT.—This mine, on Beacon Hill, is shipping large quantities of medium-grade ore from the Babbitt lease. The lessees are turning their attention to the 150-ft. level in hopes that the ore chute, from which nearly \$250,000 has been mined above the 100-ft. level, may continue to that depth.

RAVEN.—This property, on Raven Hill, still continues its output of 75 tons a week, all of which is taken out from the lower tunnel on the south slope of the hill. The shaft on the top of the hill has been sunk below the 200-ft. level, at which point a large station has been cut and preparations are made for the extension of a crosscut to intersect two well-known veins, which were productive, nearer the surface. The Raven tunnel, on the north side of the hill, has pierced the hill 1,310 ft. The number of men employed is 56.

SHERIFF.—This property, on Raven Hill, is being worked by five sets of lessees. The Jackson lease, on the north end, is shipping 20 tons of ore per week from a 40-ft. shaft. The ore is low grade, sampling from \$25 to \$30.

UNION MINING COMPANY.—This company, owning the Pike's Peak 1 and 2, the Orpha May 1 and 2, on Bull Hill, is doing well. The company is doing considerable development, and last month the output was over 500 tons, of an estimated value of \$20,000. The working expenses are not great, there being no water in any of the shafts. About 115 men are employed. The Orpha May shaft is to be enlarged and new machinery to be put on.

GILPIN COUNTY.

(From Our Special Correspondent.)

GILPIN COUNTY TRAMWAY.—Considerable ill-feeling is being evinced on the part of the quartz-haulers against the vigorous policy now adopted by the Tramway management. The Tramway has recently made connection with several important producing mines, and is destined before long to handle the bulk of the ore mined in the district outside Black Hawk. Of course, the cheaper and more convenient haulage on the tramway will be of great benefit to the industry of the camp as a whole, but it will necessarily involve throwing many of the haulers out of employment.

GILPIN GOLD, LIMITED.—The mine, mill and plant of this unucky concern are advertised for sale by the sheriff, to satisfy judgments for sums owing to various creditors.

NIAGARA.—This mine has resumed work on the return from England of the manager, Mr. E. Craig.

TOPEKA.—A company has been incorporated in Denver to rework this mine, at Russell Gulch. The shaft is 898 ft. deep, and the vein has a very flat underlie. The Topeka was a very large shipper

about three years ago, when partly owing to the exhaustion of most of the pay-ground in sight, and partly from other causes, it was closed down.

HINSDALE COUNTY.

UTE & ULAY.—Possession of these mines, near Lake City, has been given to Messrs. Nicholson and Newell, of Leadville, the new lessees of the property. Dr. Charles Gresswell, Colorado agent for the English owners, having received a cablegram informing him that the lease had been executed in London. Under the terms of the lease work on the Ute and Ulay must be commenced by December 1st.

LAKE COUNTY.

(From Our Special Correspondent.)

DRAINAGE ARRANGEMENTS.—The first step taken with reference to the draining of the Leadville Basin is in the signing of an agreement or contract by all the parties interested. Not only are the signatures of the operators themselves to be secured, but lessors as well as lessees are expected to sign the papers, which are understood to be ironclad in every particular. The principal feature of the agreement is, of course, with reference to the pumping operations, the expense of which is to be borne by all the producing mines of the Leadville Basin.

LEADVILLE CYANIDE MILL.—Since the erection of the big cyanide plant in Leadville there has been quite a revival of interest in the developments of gold properties that have long remained idle. Some of these are in the Leadville district, while others are in Red Cliff and on Taylor Hill. As depth is gained in the Taylor Hill section the free-milling oxidized ore changes to an auriferous sulphide, which the cyanide process is designed to treat successfully. It is learned that several properties on Taylor Hill are to be developed during the winter.

LEADVILLE STRIKE SITUATION.—The election of Adams as Governor of this State is a blow to the Miners' Union, the members of which were working, to a man, for Bailey. The election of Adams means that the mine managers in this camp will continue operations, and, despite the fact that the strike is still on, they will operate their properties, will increase their shipments and will carry on new enterprises in the near future. Within the next 10 days another carload of Missouri miners will be brought to Leadville and placed at work in one of the down-town properties that is ready to resume; in fact, all of the managers of the Leadville Basin, or "downtown" mines are quietly proceeding with their arrangements to start up. The necessary contracts with reference to the matter of pumping have nearly all been signed, so that it is hoped that within 10 days the big pumps of the Penrose and Ban Air will be moving again for the first time since the strike. It will probably take 60 days to complete the work of draining the basin.

LONG & DERRY.—This property has been leased by that well-known mining man, Hugh Dyatt. From geological conditions this property is one of great promise. For nearly 16 years it has been the bone of contention in a complicated lawsuit. Pending the litigation development work on the property practically ceased, but now that matters have been finally adjusted good accounts can be looked for.

NORTH STAR.—There is considerable excitement in the Iowa Gulch section, over a strike in this property. This mine was recently leased to Leadville people, and a new shaft started. A vein 3 ft. to 4 ft. wide has been encountered, and an excellent grade of carbonate ore uncovered, which runs well in silver. The vein is not over 30 ft. from the surface. The North Star ground is located above the First National property.

LARIMER COUNTY.

INDEPENDENCE SMELTING COMPANY.—This company has been organized at Loveland and its membership is composed almost entirely of residents of Loveland and Camp Carter and vicinity. The object is to purchase and operate at a portable smelter which will be placed in the vicinity of Camp Carter for the purpose of testing the ores of the adjacent mining territory. The directors for the ensuing year are: George L. Clark, president; L. H. Skelly, secretary; J. N. Gordon, treasurer; D. H. Berger and C. S. Carter. The stock has been nearly all subscribed and it is expected to have the plant in operation within 30 days.

OURAY COUNTY.

CAROLINE MINING COMPANY.—This company, of Ouray, Colo., operating an 800-volt direct-current plant, installed by the Edison Company in 1890, has recently purchased from the General Electric Company a 300 kw. multipolar generator, and in addition an 80 kw. multipolar and a 25-H. P. 800-volt mining locomotive for use in the Revenue tunnel.

SAN JUAN COUNTY.

MOUNTAIN EAGLE.—The crosscut tunnel on this mine has cut the vein at a depth of 200 ft. below the present workings. The vein is 4 ft. thick and is said to be as rich as the surface workings, which ran \$600 to the ton.

SAN MIGUEL COUNTY.

BELLE CHAMPION.—The tunnel is in 430 ft. running 100 ft. below the contact. An inclined upraise is being driven to reach the contact, where it is said that 100 cars of ore are already blocked out. Work on the incline has been temporarily suspended on account of the bad air.

CARRIBEAU.—This mill, at Ophir, was originally

constructed for 20 stamps, but only 10 stamps were placed in position. The mill has now been running a little over a month, and has proved so satisfactory that the other ten stamps have been ordered and will be working in about two weeks. The property is one of the most extensively developed in the Iron Springs mining district, there being 13 levels and a 2,000-ft. cross-cut, from which seven of the levels are connected by a 700-ft. upraise.

COMMERCIAL MINING COMPANY.—Richard Keler, formerly metallurgist of the Standard smelter of Durango, and now president and manager of this company of Saw Pit, has opened a vein between 3 and 4 ft. thick in the Commercial claim, and has shipped three cars of ore, the first taken out since the strike was made. The ore, it is said, averages from $2\frac{1}{2}$ to $3\frac{1}{2}$ oz. gold, and from 25 to 30 oz. silver, the value averaging about \$70 to the ton.

GEORGIA.

WHITE COUNTY.

ST. GEORGE.—This property was placed in the hands of a receiver recently, on the suit of Mr. John Martin to recover balance due under contract for work done and other expenses. The property is believed to contain valuable leads, but requires capital for its development.

IDAHO.

IDAHO COUNTY.

ROGERS.—A 10-stamp mill is in course of construction at this mine in the Seven Devils. The mine is owned by residents of Washington, D. C., and shows prospects of becoming a valuable property.

LEMHI COUNTY.

MONOLITH.—Alex. Toponce has sold this mine, near Shoup, to a company which will at once proceed to erect a 20-stamp mill upon the property. The battery is now at Red Rock awaiting shipment to the scene of operations.

OWYHEE COUNTY.

DE LAMAR MINING COMPANY, LIMITED.—Mr. D. B. Huntley, the manager of these properties at De Lamar, reports as follows for the month ending September 30th: Crushed (wet), 4,355 tons; crushed (dry), 3,920 tons; assay value of pulp, \$20.26, of which \$12.20 was gold and \$8.06 silver; assay value of the tailings, \$5.50; percentage saved, total, 72.85%; Dore bars produced, 20; number ounces pure gold produced, 1,569; number ounces fine silver produced, 39,877; value of gold produced, \$31,386; value of silver produced, \$25,920; surplus on bars to date, \$1,303; ore sales, \$5,200; miscellaneous revenue, \$295; total receipts, \$64,104; expenses, \$44,089; estimated profit for the month, \$20,015.

ILLINOIS.

CASS COUNTY.

VIRGINIA COAL AND MINING COMPANY.—This company has closed its mines, not having sufficient orders to pay running expenses; the assets are ample to meet all liabilities.

MACOUPIN COUNTY.

(From Our Special Correspondent.)

MOGE COAL MINE.—Mr. Charles Moge, the pioneer coal operator in the Staunton field, has returned to that city, and is at present engaged in sinking a shaft between the Chicago, Peoria & St. Louis and the Wabash Railroad tracks, one mile south of mine No. 6, of the Consolidated Coal Company. The shaft is down 100 ft. He has been sinking two months and his movements are anxiously watched by his neighbors.

KANSAS.

CHEROKEE COUNTY.

(From Our Special Correspondent.)

AMOS FREEMAN.—This plant, which has been idle for a couple of months, has started up and is running single shifts and producing 40 tons of zinc ore and 50,000 lbs. of lead each week. He is drifting at 80 ft. on a large face of lead and zinc ore in open ground.

COMBINATION COMPANY.—This company has leased 20 acres of the Murphy land adjoining the Empire Company's lease, which has been the largest producer in the county, and the Mathews' lease, which is also a large producer. They sank a prospect shaft 122 ft. and drifted at different levels, but did not get enough ore to pay expenses. About 2 weeks ago they started to drift at 80 ft., and breaking through a limestone boulder opened up a large body of lead and zinc ore in open ground and no water. They have built a wash place and for the present will clean up their ore on hand jigs.

CROWN POINT COMPANY.—This company started up its new steam concentrating plant about three weeks ago and now is producing 50 tons of zinc ore each week. They are drifting at 120 ft. on a 40-ft. face of high-grade zinc ore in shooting ground, with enough water to run the plant. They made with hand jigs about 25 tons of zinc ore each week.

ENTERKINE & LENOIX.—Jas. Enterkine and Dr. Lenoix have leased 20 acres of the Muir land, one mile west of Galena. In sinking a prospect shaft, at 50 ft. they opened up a large body of high-grade zinc ore in flint ground and no water, and are still sinking in rich zinc ore. They lay out their lease in mining lots and sub-lease them.

OLD COON COMPANY.—At this company's mine they are drifting at 85 ft. on a large face of ore in soft ground, and are producing weekly 25 tons of zinc ore, and 17,000 lbs. of lead ore, which they clean

up on hand jigs. This mine has been producing regularly for 11 months and has a large body of ore in sight.

PUMP SHAFT COMPANY.—On the De Graff Brothers' lease they are drifting at 115 ft. on a 20-ft. face of lead and zinc ore in shooting ground with enough water to wash the ores, which they clean on hand jigs and make 45 tons of zinc ore and 35,000 lbs. of lead ore.

SWITZER COMPANY.—The company is drifting at 120 ft. on a large face of ore in open ground. They clean the ore on hand jigs and are producing 31 tons of zinc ore and 3,000 lbs. of lead ore each week. They opened the ore only four weeks ago, and the face is getting richer in ore every week.

UNCLE SAM COMPANY.—This company is drifting at 105 ft. on a large face of zinc ore in shooting ground, and only enough water to wash the ore. The ore is cleaned over hand jigs, and the product is 40 tons of zinc ore each week.

UNION COMPANY.—This company is running its plant double shifts and producing 10 tons of zinc ore and 5,000 lbs. of lead each shift. They are hoisting dirt from two shafts; in one they are drifting at 85 ft. on a 32-ft. face of ore, and in the other at 90 ft. on a 40 ft. face of ore in open ground, with only enough water to run the plant.

MICHIGAN.

COPPER.

ATLANTIC MINING COMPANY.—The production of copper for October was 310 tons, the largest quantity ever reported. It compares with 258 tons in September and 270 tons in October of last year.

QUINCY MINING COMPANY.—The directors on November 9th declared an extra dividend of \$6 per share, payable on December 8th to stockholders of record on November 16th. Added to the \$14 already paid this year, this will make a total of \$20 per share for 1896.

WOLVERINE MINING COMPANY.—The output of this mine in October was 106 tons of copper, which compares with 105 tons in September and 86 tons in October of last year.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—The output of ore last week was considerably less than the week before on account of the election, the mines being shut down two days on this account. The sales were very light, as there was very little surplus ore in any of the camps, and the shipment fell short 12 cars of zinc ore and three cars of lead ore. The general outlook is growing better, due to the increasing demand and consequent advance in the price of both ores, so that the prospector has something to urge him on to make new developments.

The increase in price and the greater demand for ore will increase the output for the remaining weeks of the year. During the week an advance of \$1 per ton was paid for zinc ore, mine cars selling for \$23 per ton, with an average of over \$21 per ton. Lead ore advanced 50c, and closed the week firmer at \$15 per thousand pounds delivered. The following was sold by the different camps in the district: Joplin zinc, 1,043,760 lbs.; lead, 201,540 lbs.; value, \$14,765. Webb City, zinc, 530,450 lbs. lead, 28,310 lbs.; value, \$5,729. Carterville, zinc, 780,120 lbs.; lead, 161,950 lbs.; value, \$10,230. Galena, Kan., zinc, 2,850,000 lbs.; lead, 389,500 lbs.; value, \$30,573. Aurora zinc, 568,000 lbs.; lead, 42,000 lbs.; value, \$3,708. Alba zinc, 129,550 lbs.; value, \$1,482. Oronogo zinc, 49,340 lbs.; lead, 12,290 lbs.; value, \$777. Stott City zinc, 38,580 lbs.; value, \$444. Totals for the district: Zinc, 5,959,300 lbs.; lead, 785,490 lbs.; value, \$67,715.

I KNOW COMPANY.—This company met November 5th, and declared the regular semi-monthly dividend of 25%. This is the 22d dividend declared by this company. The highest was 75% and the lowest 25%. Altogether the stock has paid 675% on the original investment of \$2,000 for the development of the mine and \$8,000 for a large steam concentrating plant. There is still a large body of ore in sight. They are drifting at 144 ft. on a large face of zinc ore in open ground and enough water to run the plant, and at 164 ft. they have developed a large body of ore which they are not working at present on account of the low price of lead ore. They have a 10-in. pump which drains the mine and supplies the water for the plant. They have leased six lots from the Joplin Prospecting Company.

NIAGARA COMPANY.—The company will start up its mine and plant as soon as they have sold 60 tons of zinc ore that is in the bins. They are drifting at 160 ft. on a large face of ore in open ground and strong water.

YALE & O'BRIEN.—On the middle 40 of their 120-acre lease of the Jackson land in Chitwood Hollow, they sank a prospect shaft 122 ft. without getting any ore. They started to drift at 90 ft. and 1 1/2 ft. from the shaft opened up a fine-looking zinc ore prospect in flint and selvedge ground. They have an 8-in. lift-pump, which drains the ground and furnishes water to wash the ore.

MONTANA.

BEAVERHEAD COUNTY.

GOLD DREDGING COMPANY.—This company, of Bannack, has shut down its dredge for the season after a very successful run during the summer. The

company, it is said, took out about \$800 a day as an average.

DEER LODGE COUNTY.

(From an Occasional Correspondent.)

ANACONDA COPPER MINING AND SMELTING COMPANY.—It is said that both brick yards of this company are being worked to their utmost capacity by a day and a night shift. There are on the ground so far nearly 60,000,000 common and refractory brick presumably destined for the erection of a new smelter on a site of 60,000 acres below Mill Creek, and bought by Marcus Daly and J. R. Haggin. It is their intention, no doubt, to establish thereon the smelters and other works of the Washoe Company.

GRANITE COUNTY.

GOLDEN SCEPTRE GOLD MINING COMPANY.—This company, at Quigley, has assigned with debts of \$285,000. Assets are estimated at \$500,000, consisting of the company's mines and its incomplete mills, electric-power works, railroad, etc. The company has spent this year nearly \$400,000 in opening its mines and building its works, and the failure is alleged to be on account of inability to get enough money to complete them.

JEFFERSON COUNTY.

G. & B. MINE.—Messrs. Garver and Bunnell have sold this mine, on the middle fork of Warm Springs creek, to Thomas Cruse and W. J. Sweeney. The terms of the sale are reported to be \$50,000 cash.

SILVER BOW COUNTY.

BUTTE & BOSTON MINING COMPANY.—It is reported that offers have been made by parties in Boston for the 90,000 shares held by the Davis estate, which are now the chief obstacle to the complete reorganization of the company. It is doubtful, however, whether the executors of the estate have the power to sell this stock at present.

NEVADA.

ELKO COUNTY.

SALMON RIVER MINING COMPANY.—Machinery for the smelter at Salmon River mining district arrived at Wells last week. The Salmon River company has been doing considerable work on its claims in that district.

ORMSBY COUNTY.

CORTEZ MINING COMPANY, LIMITED.—This company's silver mine, after being closed some time, will at once open in full blast. Two hundred men have been engaged to commence at once, and others will be put on later.

WASHOE COUNTY.

(From an Occasional Correspondent.)

The old abandoned mining camp at Pyramid City, about 25 miles north of Virginia City, is the scene of new activity. Recently two prospectors by the name of Antone Drayovich and Hank Miller discovered a gold-bearing ledge carrying considerable free gold and twice as much silver. The formation and occurrence of vein matter is peculiar, there being three parallel stringers, called ledges by the discoverers, the exterior ones carrying the silver and the interior or middle one the gold. The new discovery was about $2\frac{1}{2}$ miles south of the old Pyramid City. There are new buildings going up and the hills are covered with prospectors. Some sixty men are working in the camp now, and several companies are reported as going to invest. Over 120 claims have been recorded.

WHITE PINE COUNTY.

BAY STATE.—This mine, in Newark district, owned and controlled by Thomas Robinson, is a silver proposition, the ore carrying on an average 100 oz. in silver, considerable lead and some gold, says the White Pine News. The two ore veins can be traced for over 2,000 ft. on the surface, are about 600 ft. apart, and dip toward each other at such an angle as to bring them together at about 200 ft. below the tunnel level, or about 500 ft. from the surface. Between two and three miles of work have been done in the mine, the development showing the vein to average between 3 ft. and 4 ft. in width. A tunnel has been run in on the vein for 500 ft., which taps the ledge at a distance of 350 ft. from the surface. A 100-ft. shaft has been sunk from the tunnel level, which makes the deepest working 450 ft. from the surface. At the present time between 4,000 and 5,000 tons of good milling ore are on the dump.

NEW YORK.

CLINTON COUNTY.

CHAUTAQUAY ORE AND IRON COMPANY.—This company has resumed work in the mines at Lyon Mountain, which have been closed a long time.

OHIO.

JACKSON COUNTY.

MINERS' STRIKE.—Three thousand five hundred miners struck in Jackson County, on November 7th, because the operators wanted to reduce the price of mining from 61c. to 45c. The prospects are that a compromise will be effected.

OREGON.

BAKER COUNTY.

WHITE SWAN.—A force of miners is at work on this mine, drifting on the ledge both ways at the strike on the 400-ft. level. Another force is at work on the shaft, which will be continued to the depth of 500 ft.

SOUTH DAKOTA.

PENNINGTON COUNTY.

(From Our Special Correspondent.)

ANNIE.—Favorable reports are received from this property, situated about four miles east of Hill City, on Spring Creek. The Annie is under development by Ohio parties, and a depth of 165 ft. has been attained. A very rich pay chute was recently encountered in drifting and a body of high-grade ore is now in sight.

HOLY TERROR.—Anything like official information has not been obtainable from this mine since the present company took charge. The fact, however, that an assessment of 5c. per share, levied early last spring to pay the cost of extended development, was cancelled as soon as the mill started, and that the shaft has been put down another 100 ft. to the 400-ft. level without further levies, would indicate that this vein, which gave such surprising returns during its early working, is still profitable. It is significant of the properties thus far opened in the Keystone District that they have proven permanent and uniform in values. There is not a mine in the belt which has been worked out or abandoned. The great need of the camp is more capital for development and larger milling capacity.

KEYSTONE.—The new cyanide plant with a capacity of 10 tons per day has just been completed by this company. Hereafter the concentrates, in which the talcose-quartz from this mine is so rich, will be treated at home, thus saving freight and smelter charges amounting to some \$15 per ton. It is stated that the capacity of the Keystone mine will be increased shortly to 40 stamps.

LENA.—This is the most important find recently made in the Central Black Hills. About a month since Arthur Baring-Gould and James Graham, the locators, began prospecting in the Union Hill district. They found rich float and opened a small stringer of high-grade ore. At this juncture they employed the services of Dr. Rothermel, the expert, who locates ledges by the "affinity" which he claims gold has for gold. Near at hand the doctor located a larger ledge whose richness would seem to establish his ability to find pay chutes. The Lena, now at a depth of about 20 ft., is a well-defined vein, about 10 in. wide, with a gouge on both walls and with all indications of being a true fissure. The ore gives surprising results in the pan and much of it will run over \$300 per ton. The find is located about 5 miles north of Hill City and near other good properties.

LUCKY BOY.—The Lintz Brothers are actively engaged in developing this property, which is situated immediately across the gulch from the Keystone mine. Some of the ores taken out are high-grade, and the average values justify milling. A contract has been made with the Keystone Custom Mill Company, under which the mill will be employed for some months in the exclusive treatment of Lucky Boy ores.

UTAH.

EIGHT-HOUR LAW.—The law passed by the Utah Legislature last winter limiting the daily hours of labor in underground mines to eight has been declared constitutional by the Supreme Court of the State. It was attacked on the ground that the law was counter to the provision in the Federal constitution that no State shall deprive a person of life, liberty, or property without due process of law. In Utah the legislation was in response to a mandate of the State constitution directing the Legislature "to provide for the health and safety of employees in factories, smelters and mines." The limiting of labor underground to eight hours a day was, in the court's opinion, a suitable provision for the health of the miners, who are obliged to work in unhealthy surroundings. With this view of the case, the Legislature had not violated its powers under the State constitution. As to the provision in the federal constitution, if Utah deprived any one of liberty or property it did it by due process of law, and therefore there was no occasion for the court to interfere.

JUAB COUNTY.

(From Our Special Correspondent.)

HOMESTAKE.—This is one of the rejuvenated properties of Silver City, in the Tintic District, and at a depth of 220 ft. cuts a 30-in. vein of ore running 2% copper and 33 oz. silver, with small gold values. The cutting of this new vein proves the continuity of the mineral zone to the southward from the Swansea.

HUMBURG.—A recent shipment of 40 tons gave net returns of \$94 per ton, the lowest average price yet received from these ores. With scarcely anything but surface work the property in four weeks has shipped 200 tons of ore which have netted over \$110 per ton.

TOOELE COUNTY.

(From Our Special Correspondent.)

CLIFTON & GOLD HILL.—This company, in the Deep Creek country, is laying a pipe line 23 miles long from Fifteen Mile Creek for a plentiful supply of good water for milling purposes. There are now five Crawford mills at work, but the enforced economy of water occasioned sliming of the pulp and a consequent loss of values.

OMAHA.—This prospect is on the west dip of the Mercur ore zone, and recent assays show various values in gold per ton. The Omaha is situated in a syncline of one of the folds of the Mercur ore zone.

UINTA COUNTY.

GILSONITE ASPHALTUM COMPANY.—This company, of St. Louis, has shipped over 2,000,000 lbs. of asphaltum from its mines so far this year. The deposits of this commodity are located near Fort Duchense, and the nearest shipping point is at Price, on the Rio Grande Western road. The company has been working these asphaltum mines for the past nine years.

UTAH COUNTY.

PROVO ANTHRACITE COMPANY.—This company is at work on its coal property in Rock Canyon. They are running a tunnel through the mountain about 600 ft. below where they took out coal last year, believing they will strike a superior quality and a larger body of the coal.

Rasband Bros. and John Diem have encountered a vein of lead-silver ore on their ground in American Fork. Assays made from blossom rock gave returns of 33% lead, 5 oz. in silver and a trace in gold.

(From Our Special Correspondent.)

MARY ELLEN.—This property is situated in American Fork Canyon and has not produced since 1880. A revival of activity in the district has given old properties a valuation, and the Mary Ellen has been purchased by Allen G. Campbell from Matthew Cullen for \$35,000.

WASHINGTON.

PIERCE COUNTY.

TACOMA SMELTING AND REFINING COMPANY.—This company's product for October, 1896, was: 5,200 bars bullion, weighing 535,858 lbs., containing 2,063.20 oz. gold, valued at \$42,646; 46,518.14 oz. silver at 65c. per oz., valued at \$30,237; 532,526 lbs. lead at \$2.60 per lb., or \$13,846, a total of \$86,729. There were 79 men employed and the payroll was \$5,728, and for wood-choppers and teams \$667, a total of \$6,395.

WYOMING.

LARAMIE COUNTY.

GOOD FORTUNE.—The owners of the Hartville iron mines have made a contract with Kuykendall Bros., of Denver, Colo., to haul 4,000 tons of iron ore from this mine at Hartville to Badger, a station on the Cheyenne & Northern Railway, for shipment to the Grant smelter at Denver.

FOREIGN MINING NEWS.

AUSTRIA-HUNGARY.

GALICIA.

OZOKERITE MINES.—Negotiations are pending for the sale of the Ozokerite mines in the district of Boryslav, to a syndicate represented by the Landerbank of Vienna. The object of the syndicate is to control the entire production and to consolidate and systematize operations in the mines. These ozokerite mines were very fully described in Vol. IV. of *The Mineral Industry*.

BRITISH COLUMBIA.

(From an Occasional Correspondent.)

COMOX COLLIERIES.—R. Dunsmuir & Sons, owners of the collieries at Comox, Vancouver island, have erected 100 coke ovens at Comox. The coke made is of good quality and firm, containing a trace of sulphur and low in ash. The cost to consumers would be about \$5 per ton at Comox.

KAMLOOPS DISTRICT.—About five miles south of Kamloops, on the Canadian Pacific Railway, at the back of Coal Hill, large deposits of copper pyrites carrying some gold have been discovered. The mineral appears to be associated with dykes of diorite. The mineralized belt is some two miles wide from north to south and six miles long east to west, judging by the outcroppings.

TEXADA ISLAND.—The mines on the north end of Texada Island are now being developed, the shaft on the Van Anda mine being 100 ft. deep. The lode in the bottom of the shaft is from 3 ft. to 4 ft. 6 in. wide, and is composed of massive purple copper ore carrying from 10 to 18 oz. silver, \$12 to \$15 in gold, and 20% to 35% copper. At this end of the island, on Blubber Bay, there is a large body of crystallized limestone and at its junction with the granite intrusions of porphyry occur with which are associated deposits of copper, usually with heavy iron capings. The surface cappings have shown assays of \$14 gold, 10 oz. silver, and 1% copper. These deposits are within a quarter of a mile of the salt water on Blubber Bay, and within 30 miles, by sea, of the coke ovens at Comox.

BRITISH GUIANA.

BARIMA GOLD MINING COMPANY.—This company, the first quartz mining company of the colony, reports for the month ending October 15th, a total of 970 tons ore worked, the proceeds being 797 oz. gold, showing an average of 0.82 oz. per ton.

NEW SOUTH WALES.

BROKEN HILL PROPRIETARY COMPANY.—This company's statement for the four weeks ending October 15th shows that there were 28,859 tons of ore worked. The output of the refinery for that period is stated as follows: 409 fine oz. gold, 646,086 fine oz. silver, 1,500 tons soft lead, 50 tons antimonial lead and 242 tons copper matte. The contents of the matte were 44 tons fine copper and 27,996 fine oz. silver.

NEW ZEALAND.

GOLD EXPORTS.—The official report gives the

quantity of gold entered for export from the colony during the three quarters of the year which have already passed as follows, in crude ounces:

	1895.	1896.	Changes.
First quarter.....	67,215	76,403	I. 9,188
Second ".....	63,915	44,181	D. 19,734
Third ".....	70,964	76,079	I. 5,115
Nine months.....	202,094	196,663	D. 5,431

These exports do not, of course, cover the full production, nor do they furnish an index as to the exact period during which the production took place, since gold turned out in one quarter may be held until the next before it is shipped. Very few of the New Zealand companies make any regular returns of operation, and the only figures approaching exactness are the yearly returns of the mines department.

GOVERNMENT DEEP MINING GRANTS.—The assistance given by the colonial government to the Kapanga and other companies which have undertaken deep explorations has proved so fruitful of results that a further amount of \$1,000,000 has been voted for the same purpose. The government is also considering a plan for a thorough geological survey of the northern gold-fields of the colony.

HAURAKI GOLD MINING COMPANY.—This company reports for September 412 tons of ore worked, producing 2,039 oz. gold, or an average of 4.95 oz. per ton. For the nine months ending September 30th the total work included 3,218 tons of ore crushed, from which 19,165 oz. gold were obtained, showing an average result of 5.96 oz. per ton. The total expenses for the nine months are reported at \$76,560, or \$23.78 per ton crushed, while the net profit was \$204,732, or \$63.64 per ton. The average cost per ounce of gold reported was \$3.99 for the nine months.

WAITEKAURI GOLD MINING COMPANY.—This company reports for the 9½ months of this year up to October 15th a total of 26,870 tons of ore crushed. The value of the gold bullion obtained from the ore was \$459,192, showing an average return of \$17.00 per ton worked.

LATE NEWS.

THE DE LAMAR MINES.—According to late advices from London, Mr. J. R. De Lamar has given to parties there an option on the De Lamar mine in Nevada. He is also making arrangements to consolidate his more recent purchases in Utah with the Mercur, and negotiations are pending for the sale of the entire property.

THE HOEFPNER ZINC PROCESS.—We are informed that Dr. Hoepfner has completed arrangements with Brunner, Mond & Company, in England, to introduce and use his process for the treatment of low-grade zinc ores and for the recovery of the chlorine from the zinc chlorides by electrolysis. It is expected that the necessary plant will be completed and the process will be in operation in January next.

ALASKA TREADWELL GOLD MINING COMPANY.—This Alaska Company reports the clean-up for the month of October, as follows: Period since last return, 30 days; bullion shipment, \$61,304; ore milled 21,506 tons; sulphurets treated, 376 tons. Of bullion there came from sulphurets, \$21,494. The gross expenses for the period were \$23,733, leaving a balance of \$37,571 as profit for the month. The total receipts were \$2.84 and the expenses \$1.10 per ton of ore milled.

THE INDIANA OIL-FIELD.—Late despatches say that within the last week contracts for drilling a number of new wells have been let in the Indiana oil field. The Standard Oil Company, the Rowland-Zeigler Company, W. S. Morton and others are putting strings of tools at work. The Salamonic Natural Gas Company, which furnishes the city of Fort Wayne, is drilling 15 wells in the vicinity of Mill Grove. Five new wells, producing from 40 to 90 bbls. daily, have come in.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Nov. 13.

Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending November 7th, 1896, compared with the corresponding period last year:

	1896.		1895.
	Week.	Year.	Year.
Pennsylvania Railroad.....	74,001	3,125,322	3,220,006

PRODUCTION OF BITUMINOUS COAL, in tons of 2,000 lbs. for week ending November 7th, and for years from January 1st, 1896 and 1895:

	1896.		1895.
	Week.	Year.	Year.
Shipped East and North:			
Allegheny, Pa.....	38,952	2,379,470	2,578,639
Barclay, Pa.....	1,092	38,684	60,000
Beech Creek, Pa.....	60,421	2,545,815	2,452,920
Broad Top, Pa.....		1,905,043	224,086
Clearfield, Pa.....	59,737	3,781,591	4,453,608
Cumberland, Md.....	81,565	2,916,675	2,481,218
Kanawha, W. Va.....	114,349	3,167,903	2,520,674
Phila. & Erie.....	4,572	65,588	44,540
Pocahontas Flat Top.....		*2,653,904	1,922,723
Totals.....	290,428	26,607,673	16,748,348

* For year ending October 31st.
† For 10 days to Oct. 31st.
‡ For year ending October 31st.

Shipped West:	1896.		1895
	Week.	Year	Year
Monongahela, Pa.	23,776	1,071,178	642,956
Pittsburg, Pa.	32,201	1,643,631	1,418,505
Westmoreland, Pa.	30,699	1,612,221	1,450,691
Totals	86,676	4,287,033	3,512,152
Grand totals	416,761	22,147,706	20,260,500

Production of coke on line of Pennsylvania Railroad for the week ending November 7th, 1896, and year from January 1st, 1896, in tons of 2,000 lbs.: Week, 56,957 tons; year, 3,327,653; to corresponding date in 1895, 4,998,811 tons.

Anthracite.

The anthracite coal trade during the past week has not been of such a nature as to indicate the immediate realization of the hope that was general a week ago that an improvement in the trade was to be felt as the result of the solution of the political question. One company reports having done a fair amount of business and the receipt of quite a number of inquiries; nearly all have nothing new to report, and one company says the week's trade was duller, for the time of the year, than any other week with which comparison can be made. Even the weather seems to have conspired, with other unsatisfactory conditions, to keep the trade in a sluggish condition.

The West has had a fall of snow within the last few days, of unusual severity for the time of the year, which the Eastern coal people would have been only too glad to share for the benefit of the trade here. All hope of a brisker business is deferred until cold weather sets in; at least no other factor is now known that will brighten trade as much as would the weather. The heavy rains of last week caused a temporary suspension of operations at a number of collieries in the Schuylkill region, the decreased tonnage from that section, due to the suspension, being noticeable at tidewater this week. It was an unlooked-for restriction of the output that the market could well endure. From present indications, however, the tonnage for November will be fully equal to that for October. These indications are necessarily subject to revision by the north winds.

The September schedule of prices is as follows: \$4 for broken, \$4.25 for egg and chestnut and \$4.50 for stove.

Bituminous.

The Atlantic seaboard soft-coal trade this week is perhaps not in quite as good a condition as it was a week ago. The first increase in trade noted two or three weeks ago was due to the discounting of the election by certain consumers who did not wait for the final verdict before placing orders. This trade was slightly increased by the actual result, immediately following which other orders that had been withheld came into the market. The first rush of business due to this cause has now subsided; hence the less active condition of the market at present. The orders now coming in are for coal required merely for the regular working consumption. Regardless of this, however, there is still a fair amount of business in hand to be attended to.

Sound business is still increasing, and the Sound ports are taking more than their proportionate amount of the trade. Trade to the far East, on the contrary, seems to have dropped off a little from its requirements of a week ago.

New York harbor business continues quite good, the tonnage going forward being about the same as last week. Trade local to the shipping ports continues to show the improvement that was noted in our last report.

All-rail business is steady, and the general tone of this trade is better. Transportation from mines to tide is excellent, the improvement having naturally followed with the falling off in shipments. Car supply is up to all demands, requisitions being filled promptly by all railroads.

In the coastwise vessel market there is a fair supply of vessels, with about enough orders on hand to absorb them readily. Some late charters show a tendency toward a weakening of freight rates.

We quote current rates of freight from Philadelphia as follows: To Boston, Salem and Portland, 80¢@85¢; Providence, New Bedford and other Sound ports, 65¢@70¢; Wareham, 85¢; Lynn, 90¢@95¢; Newburyport, 95¢; Portsmouth, 90¢; Dover, \$1.10, alongside and towage; Saco, \$1, alongside and towage.

The association prices remain as follows: F. o. b. Philadelphia, Norfolk and Newport News, \$2.35; Baltimore, \$2.28; New York Harbor shipping ports, \$2.80, alongside; New York Harbor, \$3. There is a 20c. differential in favor of Clearfield and Beech Creek coals.

NOTES OF THE WEEK.

Coal receipts at San Francisco by sea in October were 119,601 tons. For the ten months ending October 31st the receipts were 1,060,535 tons, which compares with 1,136,869 tons for the corresponding period in 1895, and 1,090,242 tons in 1894. The receipts for the ten months this year were from the following sources: Eastern, anthracite and Cumberland, 15,168 tons; Oregon and Washington, 379,604; Alaska, 800; British Columbia, 362,379; Australia, 179,712; Tonkin, 1,487; Great Britain, 121,385 tons. This statement does not include the coal received from the Monte Diablo mines in California.

Buffalo.

The coal trade remains in the same condition with regard to prices as was stated last week, but there

is a better demand the past few days, both for home consumption and from nearby towns. Navigation is nearing a close; freights on coal are steady, but with no apparent increase in quotations, as the supply is not adequate for the loading of the vessels offered. The weather has been changeable; snow storms, frosts, high winds, then glorious sunshine and Indian summer.

The Erie, Champlain, the Black River, the Oswego and the Cayuga and Seneca canals will be closed on December 1st, at noon.

The shipments of coal westward by lake from Buffalo from November 1st to 7th, both days inclusive, aggregated 81,965 net tons, distributed as follows: 34,509 tons to Chicago, 19,700 tons to Milwaukee, 10,900 tons to Duluth, 4,000 tons to Superior, 2,555 tons to Toledo, 700 tons to Gladstone, 5,100 tons to Menominee, and 4,450 tons to ports not stated. The rates of freight were 30c. to Chicago, Milwaukee and Manitowoc; 40c. to Green Bay and Saginaw, 25c. to Toledo, and 30c. to Duluth, Superior and Gladstone. Closing firm, but quiet.

The following statistics of the coal trade of the port of Buffalo, N. Y., were compiled by Mr. William Thurstone, the Secretary of the Merchants' Exchange.

Railroad receipts and shipments not reported by request. No receipts of coal by lake for several seasons past and present. Shipments of coal westward by lake for the month of October 378,977 net tons, as compared with 486,144 net tons in 1895 and 389,378 net tons in 1894; for the season to November 1st 1,953,058 net tons, as compared with 1,962,325 net tons in 1895 and 1,953,335 net tons in 1894. The receipts of coal by canal for the month of October 12,818 net tons, as compared with 988 net tons in 1895 and 4,084 net tons in 1894; for the season to November 1st 37,078 net tons, as compared with 11,154 net tons in 1895 and 30,287 net tons in 1894. The shipments by canal for month of October, 441 net tons as compared with no net tons in 1895 and 456 net tons in 1894; for the season to November 1st, 1,196 net tons as compared with 4,289 net tons in 1895 and 6,725 net tons in 1894. The aggregate shipments of coal westward by lake this season to November 1st show a decrease of 9,267 net tons as compared with 1895, and a decrease of 297 net tons as compared with 1894. The rates of freight during the month of October, 1896, were 20¢@30¢. to Chicago and Milwaukee. 20¢. to Duluth and Lake Superior ports, 30¢@40¢. to Green Bay, 20¢@25¢. to Toledo, 25¢. to Detroit, 40¢@50¢. to Racine, 40¢. to Saginaw, and 25¢@30¢. to Bay City. A year since the rates were 75¢@90¢. to Chicago, 65¢@85¢. to Milwaukee, 30¢. to Duluth and Lake Superior ports, 65¢@80¢. to Green Bay, 25¢@50¢. to Toledo, 25¢@40¢. to Detroit, \$1 to Racine, 45¢@60¢. to Saginaw, and 30¢@40¢. to Bay City.

The shipments of coal by lake thus far this season to November 1st were distributed about as follows: 761,386 net tons to Chicago, 531,406 tons to Milwaukee, 2,926 tons to Duluth, 80,807 tons to Toledo, 21,134 tons to Manitowoc, 21,800 tons to Gladstone, 8,750 tons to Ashland, 167,731 tons to Superior, 13,075 tons to Marquette, 12,489 tons to Fort William, 4,420 tons to Sault Ste. Marie, 1,070 tons to Portage, 11,860 tons to Lake Linden, 74,300 tons to miscellaneous ports by vessels from Tonawanda, etc.; 22,575 tons to Racine, 24,200 tons to Green Bay, 7,990 to Kenosha, 200 tons to Oscoda, 14,665 tons to Bay City, 15,345 tons to Saginaw, 1,750 tons to Marinette, 3,150 tons to Detroit, 530 tons to Sturgeon Bay, 475 tons to St. Clair, 400 tons to Marine City, 450 tons to Algonac, 525 tons to St. Ignace, 2,050 tons to Menominee, 600 tons to Grand Haven, 1,200 tons to Benton Harbor, 678 tons to Windsor, 388 tons to Midland, 3,350 tons to Washburn, 180 tons to Pequaming, 5,200 tons to Hancock, 800 tons to Cheboygan, 2,100 tons to Port Arthur, 320 tons to Sandbeach, 1,250 tons to Sheboygan, 100 tons to Alpena, 400 tons to Ontonagon, 300 tons to Manistique, 500 tons to Huron, O., 1,150 tons to Port Huron, 300 tons to Bay Mills, 2,125 tons to Michigan City and 25 tons to Grand Marais.

Pittsburg.

Nov. 12.

(From Our Special Correspondent.)

Coal.—The market is in a good shape along the upper Monongahela; the mines are running full and miners are scarce. The fine stage of water has enabled coalmen to bring up empties sufficient to keep the miners employed most of the winter; the miners as well as the operators are well pleased with the outlook. On Saturday we had a small shipment to Cincinnati aggregating 225,000 bu. A joint convention of coal miners and operators will be held the latter part of November to consider plans for arranging a new agreement for next year; an effort will be made to continue the "uniformity" agreement, entered into last December, about which there has been so much controversy. Among the railroad mines there is considerable activity in filling orders for the mills that are to start up as soon as they can be made ready. The closing of the Lake season will also bring a rush of shipments to Lake ports. As a result, the mines on the Youghiogheny River that have been supplying coal to shippers have been ordered closed. Some operators believe, however, that the suspension will be only temporary.

Connellsville Coke.—The reports of last week's coke trade are most encouraging. The improvement is not by spasmodic jumps but by a steady upward movement, which indicates that it will be permanent. The demands for coke and consequent operations of the plants have been increasing. The trade has maintained a steady upward movement for several weeks, which promises to continue. The

list of active ovens was increased 20 last week by the firing of 100 ovens at Kyle and the blowing out of 80 at Fairchance by the Frick Coke Company; no other changes were made, but the working time was materially increased by the Frick Company, which operated all its plants five days. New features do not exist in the coke trade at present; the situation is one of waiting. An advance of coke and coke wages for the first of the year is talked of. The report for the week shows the ovens in operation averaged 5.10 days, an increase of 0.33 day over the preceding week. The estimated production was about 68,000 tons; increase, 24,000 tons; shipments, 3,771 cars. A number of the Valley furnaces have been stocking coke for an expected boom in iron. The starting up of the Johnstown mills has not affected the coke industry, yet the shipments were: To Pittsburg and river points, 1,825 cars; points west of Pittsburg, 1,370 cars; points east, 576 cars.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Nov. 13, 1896.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From		From	
	Nov. 15, 1895.	Nov. 13, 1896.	Jan., '95.	Jan., '96.	Jan., '95.	Jan., '96.
Anthracite.	58	36,350	27	15,950	1,054,718	1,039,610
Coke...	156	180,160	85	116,200	6,701,014	6,510,504
Charcoal...	24	5,090	21	5,200	192,815	262,466
Totals	238	221,600	133	127,250	7,948,547	7,831,979

The production during November will increase steadily, as some furnaces have already gone into blast since November 1, and others are preparing to follow.

The period of waiting in the iron market is over, and from every direction we hear of furnaces and mills starting up, orders coming in, and preparations made for an active business. Possibly things may be a little overdone in the first rush to get into line; but there is undoubtedly a solid basis for this activity, and prosperous trade is to be expected. Everywhere stocks are low, and the improvement in demand at once starts the mills.

The steel combination is holding a protracted meeting in New York this week. The sessions are private and the results have not yet been announced. It is understood that the chief point under discussion is the difference between the mills which make billets for sale and those which own also rolling mills and other works, and turn their own billets into finished forms.

The Bolt Manufacturers' Association met in Pittsburg this week, but did not agree on any change in prices. The next meeting will be held in New York early in December.

The Bar Iron Association has resolved to increase the price of iron bars by \$2 per ton.

NOTES OF THE WEEK.

The Dean Iron Mines, at Highland Falls, N. Y., have resumed work. These mines were first worked during the Revolutionary War. They were worked for more than a century with very few interruptions, but were closed down in 1894.

Benjamin Talbot, of Pencoyd, Pa., has sold his basic lining patent to the Bessemer Steel Association. The patent has been considered of great importance so far as basic open-hearth steel manufacture is concerned. The Steel Association is evidently arranging to control the basic steel manufacture, fully recognizing its coming importance.

The special agent of the Treasury Department reports that during the fiscal year ended June 30th, 1896, the production in the United States of commercial tin and terne plates was 307,228,621 lbs. against 193,801,073 lbs. produced during the previous fiscal year, showing thereby an increased production of more than 58%. Of the production for the year 303,002,098 lb. or more than 93%, were made from sheets rolled in the United States against about 83% made from such sheets during the fiscal year 1894-1895. The figures show that more than 86% of the production belonged to the class of plates weighing lighter than 63 lbs. per 100 sq. ft., the proportion being about the same as that for the previous fiscal year. Of the entire production 69% consisted of tin plate, against 62% for the preceding year. The report embraces the production of 53 firms, the output of two firms which were producing but made no report not having been considered. The quantity of American sheet iron and steel made by stamping and other manufacturing firms into articles and wares which were afterward tinued, stated by quarters, was 10,586,110 lbs., an increase of 4,200,770 lbs. The production of black plates in the United States during the fiscal year, stated by quarters, was 334,014,793 lbs., an increase of 143,443,319 lbs., or about 80%. The production of such plates lighter than 63 lbs. per 100 sq. ft. is 77%, as compared with 80% during the preceding year. In all 36 rolling mills were producing black plates during the fiscal year, against 28 that were producing during the previous year. Of the 53 firms reported as producing commercial tin and terne plates during the fiscal year, 50 used wholly American plates, with an output of 291,725,467 lbs., and three used both American and foreign plates, with an aggregate output of 15,503,154 lbs., of which 11,276,631 lbs., of

the mines during last month was 45,000 tons, the actual shipments were only 8,000 tons, owing to the high rate of freights. As much as 14s. 3d. was paid for a steamer for Middlesboro; this is fully 5s. per ton higher than the maximum figure on which merchants have been basing their calculations. As a proof of the change in the position of the market we may mention that it is scarcely three months since a cargo of Cartagena dry ore was sold delivered at Middlesboro at 10s. 6d. per ton.

We quote for iron ores as follows: Ordinary, 50% Portman ore, 5s. 6d @ 6s. per ton; special low phosphorus ore, 5s. 9d. @ 6s. 2d.; extra quality and special ores, 6s. 6d. @ 7s.; specular ore, 60% iron and 0.03% phosphorus, 9s. 3d. For manganiferous ores quotations are: No. 1, 20% iron and 20% manganese, 15s. per ton; No. 1 B, 25% iron and 17% manganese, 12s.; No. 2, 30% iron and 15% manganese, 11s. 3d.; No. 3, 35% iron and 13% manganese, 9s. 6d. All prices are f. o. b. shipping port, Cartagena or Portman. Iron pyrites, 40% iron and 45% sulphur, are quoted at 10s. 6d. per ton, f. o. b. Cartagena.

METAL MARKET.

NEW YORK, Friday Evening, November 13, 1896.

Gold and Silver.

Prices of Silver per Ounce Troy.

Novemb'r.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.	Novemb'r.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.
7	4 84 3/4	30	65 1/2	.504	11	4 85 3/4	29 1/2	64 3/4	.502
9	4 84 3/4	29 1/2	65	.503	12	4 85	29 1/2	64 3/4	.501
10	4 85	29 1/2	65	.503	13	4 85	29 1/2	64 3/4	.501

The silver market presents no new feature. A small liquidation as the result of the Presidential campaign is going on, and the eastern demand being rather moderate the price has slightly receded. Sales, however, are not pressing. Part of the bullion coming forward is being used to cover future sales. The United States Assay Office in New York reports the total receipts of silver at 132,000 oz. for the week.

Average Monthly Prices of Silver

in New York and London, per ounce Troy, from January 1st, 1896, and for the years 1895 and 1894.

Month.	1896.		1895.		1894.	
	Lon-don. Pence.	New York. Cents.	Lon-don. Pence.	New York. Cents.	Lon-don. Pence.	New York. Cents.
January	30 69	67 13	27 36	59 69	30 81	66 63
February	31 01	67 67	27 47	59 90	29 18	63 43
March	31 34	68 40	28 33	61 98	27 28	59 49
April	31 10	67 92	30 39	66 61	28 95	62 92
May	31 08	67 85	30 61	66 75	28 69	62 96
June	31 46	68 69	30 47	66 61	28 68	62 59
July	31 45	68 75	30 48	66 75	29 82	62 45
August	30 93	67 34	30 40	66 61	28 29	61 83
September	30 49	65 68	30 54	66 90	38 88	64 14
October	29 68	65 05	30 89	67 64	28 69	63 06
November			30 79	67 40	39 41	65 13
December			30 40	66 47	27 74	60 43

The New York prices are always per fine ounce, or ounce of pure silver; the London quotation is per standard ounce, or for metal '925 fine.

Gold and Silver Exports and Imports.

At all United States ports, September, 1896, and years from January 1st, 1896 and 1895:

	Coin and bullion.		In ores.		Total excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
GOLD					
Sept.	\$61,050	\$34,159,130	\$32,505	\$183,608	I. \$34,249,183
1896.	55,570,421	64,888,856	114,201	1,356,019	I. 10,560,253
1895.	73,190,282	28,839,939	326,653	1,306,112	E. 43,370,884
SILV.					
Sept.	5,534,110	741,678	168,880	1,212,605	E. 3,748,707
1896.	46,441,041	8,454,637	564,842	13,216,568	E. 25,334,678
1895.	38,664,610	7,980,664	99,965	9,128,483	E. 21,655,448

This statement includes the exports and imports at 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 November 13th, 1896, and for years from January 1st, 1896, 1895, 1894, 1893 and 1892:

	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
We'k	\$106,395	\$2,074,080	\$870,100	\$65,069	I. \$1,162,654
1896	40,603,343	74,962,615	32,784,581	3,419,250	I. 4,993,941
1895.	60,048,637	27,506,300	31,000,902	1,486,795	E. 65,046,464
1894.	85,481,363	15,265,364	30,009,140	1,556,608	E. 98,668,233
1893.	70,282,654	60,969,397	27,979,819	3,084,150	E. 34,208,326
1892.	59,317,453	7,760,089	19,228,460	2,877,763	E. 67,908,061

The gold exported for the week went to the West Indies; the silver went to London. The gold and silver imported came from Europe, and Central and South America.

FINANCIAL NOTES OF THE WEEK.

General business shows a very striking improvement. Mills and factories are starting up everywhere, railroad traffic is rapidly increasing; at all the business centers there is activity to a degree which has been unknown for a year past. The general opinion is expressed that the winter will see a marked improvement. In New York there has been a rapid rise in the prices of securities, and the money market has become very much easier, so that loans are being placed and business paper discounted with little difficulty and at moderate rates of interest.

Gold imports will soon be stopped for the time, chiefly under the influence of the recent increase of interest and discount rates in London and all over the continent of Europe. Some gold previously ordered is arriving this week. The exchange rate continues close to the importing point, however, though it was sent up for a day or two by a heavy sale of United States bonds here on London account. This sale was at first reported made on account of the Bank of England, but this was contradicted later.

Not long ago we noted the failure of the city of New York to obtain satisfactory bids for its bonds, which are generally considered first-class securities. The change was shown very strikingly this week, when the Comptroller of the city opened new bids for a total of \$16,046,590 in 3% bonds. The total amount of the bids received was about \$183,000,000, or more than 11 times the amount of the bonds. The prices bid ranged from par up to 116 for some small amounts. After considering all the offers the entire issue was awarded to Vermilye & Company, of New York, at 104.71, a very satisfactory price.

The extent to which the hoarding of gold has been going on is shown by the large amount which has been coming into the banks and the sub-treasury during the week. This gold has come in all sorts of sums, large and small, and is evidently drawn from private depositories and once more brought back into circulation. The treasury gold reserve is rising steadily and apparently will continue to do so for some time.

The coinage executed at the Mints of the United States during the month of October, 1896, is given by the Treasury Department as follows:

Denominations.	Pieces.	Value.
Double eagles.....	285,000	\$5,700,000.00
Half-eagles.....	5,500	27,500.00
Total gold.....	290,500	\$5,727,500.00
Silver dollars.....	2,350,000	2,350,000.00
Half dollars.....	516,000	258,000.00
Quarter dollars.....	772,039	193,009.75
Dimes.....	430,000	43,000.00
Total silver.....	4,068,039	\$2,844,009.75
Five cent.....	521,000	26,050.00
One cent.....	4,085,000	40,850.00
Total minor.....	4,606,000	\$66,900.00
Total coinage.....	8,964,539	\$8,638,409.75

The coinage of silver dollars continues steadily. Gold coinage for the month was chiefly confined to double-eagles.

Shipments of specie by water from San Francisco for the ten months ending October 31st included \$10,174,228 silver, of which there was in United States coin \$651,025; in Peruvian coin, \$122,867; in Mexican dollars, \$4,627,958; in silver bars, \$4,712,378. The gold shipments were \$11,469,370, of which there was \$46,581 in bullion and \$11,422,789 in coin. The destinations of the above shipments were as follows:

	1895.	1896.
Hongkong.....	\$9,093,167	\$3,187,208
Shanghai.....	4,361,300	2,540,030
Japan.....	1,082,594	3,632,028
India.....		35,000
Central America.....	268,298	161,060
Honolulu.....	371,040	880,790
Mexico.....	4,859	4,140
New York.....	4,099,843	12,143,336
Total.....	\$19,283,692	\$22,583,692

The increase shown this year was due to the heavy shipments of gold coin to New York. There was a large decrease in the quantity of silver going to China and Japan.

The statement of the United States Treasury on Thursday, November 13th, shows balances in excess

of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

	Nov. 5.	Nov. 12.	Changes.
Gold.....	\$114,957,108	\$122,274,589	I. \$7,317,481
Silver.....	12,549,240	13,491,790	I. 942,550
Legal tenders.....	58,765,290	50,818,410	D. 7,946,880
Treasury notes, etc.....	39,631,735	39,885,676	I. 253,941
Totals.....	\$225,903,313	\$226,470,465	I. \$567,152

Treasury deposits with national banks amounted to \$16,684,944, showing an increase of \$223,781 during the week.

Total United States Treasury notes issued under act of July 14th, 1890, in general circulation and in the Treasury, \$122,710,280. Against these are held in the Treasury 10,748,434 coined standard silver dollars, and silver bullion purchased at a cost of \$111,961,846, making a total of \$122,710,280.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending November 7th, gives the following totals, comparisons being made with the corresponding weeks in 1895 and 1894:

	1894.	1895.	1896.
Loans and discounts.....	\$489,714,700	\$495,923,260	\$442,179,700
Deposits.....	592,176,200	527,985,800	438,437,600
Circulation.....	11,207,600	14,863,300	20,516,800
Reserve:			
Specie.....	93,677,100	61,419,800	63,702,600
Legal tenders.....	116,036,600	86,824,700	60,717,700
Total reserve.....	\$209,713,700	\$151,244,500	\$124,420,300
Legal requirement.....	148,444,050	131,983,850	109,649,400
Surplus reserve.....	\$61,669,650	\$19,260,650	\$14,810,900

Changes for the week this year were increases of \$20,500 in circulation and \$924,500 in specie; decreases were \$4,070,700 in loans, \$8,003,300 in deposits, \$5,579,400 in legal tenders and \$2,652,825 in surplus reserve.

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

	Gold.	Silver.	Total.
Asso. Banks of New York.....			\$63,702,600
1895.....			62,778,100
Bank of England.....	\$177,324,975		177,324,975
1895.....	204,733,840		204,733,840
Bank of France.....	586,373,000	\$245,855,400	632,228,600
1895.....	389,530,158	246,174,211	635,704,369
Imp. Bank of Germany.....			208,060,000
1895.....			227,970,000
Austro-Hungarian Bank.....	152,070,000	62,892,000	214,962,000
1895.....	113,430,000	64,450,000	177,880,000
Netherlands Bank.....	13,173,000	33,505,000	46,678,000
1895.....	21,337,000	33,714,000	55,051,000
Belgian National Bank.....			20,700,000
1895.....			21,639,000
Bank of Spain.....	42,641,000	49,085,000	91,726,000
1895.....	40,022,000	54,632,000	94,654,000
Bank of Italy.....	61,085,000	12,205,000	73,290,000
1895.....	59,650,000	9,405,000	69,055,000
Imp. Bank of Russia.....	471,640,000		471,640,000
1895.....	403,865,000		403,865,000

The return for the Associated Banks of New York is of date November 7th; all the others are of November 12th, except the Bank of Italy, October 10th, and the Bank of Russia, October 1st-13th. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England and the Bank of Russia report gold only. The Imperial Bank of Germany and the Belgian National Bank do not report gold and silver separately.

Shipments of silver from London to the East for the year up to October 25th are reported by Messrs. Pixley & Abell's circular as below:

	1895.	1896.	Changes.
India.....	£2,968,980	£3,735,478	I. £766,498
China.....	1,580,610	698,246	D. 882,364
The Straits.....	668,753	545,686	D. 123,067
Totals.....	£5,218,343	£4,979,410	D. £238,933

Arrivals for the week were £187,000 in bar silver from New York. Shipments for the week were £258,000 in bar silver to India, and £43,833 to China; a total of £301,833.

Indian exchange continues at a high level under present and prospective demands for remittances on account of railroads and public works, and the possibility of emergency expenditures in certain districts where the crops have entirely failed contributes to maintain the price. The discount rates of the Indian banks also continue high, with prospects of still further increases. The 40 lakhs of Council Bills offered in London were all taken at an average price of 14'85d. per rupee, and the tendency is toward a still higher price.

Russia continues to accumulate gold at an extraordinary rate. The amount held by the Bank of Russia on October 1st, as compared with January 1st, 1895, was as follows:

	Jan. 1, 1895.	Oct. 1, 1896.
Issue department.....	\$274,900,000	\$390,650,000
Banking department.....	30,650,000	46,400,000
Total Bank.....	\$305,550,000	\$437,050,000
Government deposits.....	156,100,000	91,500,000
Total gold.....	\$461,650,000	\$528,550,000

The figures differ slightly from those of the regular semi-monthly statement. Notwithstanding this great accumulation, gold has recently been bought on Russian account, both in London and Berlin, in considerable amounts.

Costa Rica is arranging to adopt the gold standard, and the National Congress is now in session considering the necessary measures. The committee to which the measure was referred recommended as the unit of the proposed new system the colon, a gold coin weighing 775 milligrams and 900 fine. These are to be coined in denominations of 2, 5, 10 and 20 colones. The colon is equal in value to one peso of silver, formerly the standard in Costa Rica, the proportion being 700 parts of gold to 18,750 parts of silver, or approximately 1 to 26.8. Silver is to be used only for fractional currency, the denominations to be of 5, 10, 25 and 50 centimes of a colon. The last-named piece, the half colon, will be the highest silver coin. It is proposed to make silver a legal tender for only 20 half-colones. The total amount of silver coin is not to exceed in value 20% of the gold currency. Foreign gold coins will be allowed to circulate, and will be accepted at their actual bullion value. Foreign silver will not be accepted as legal tender. Costa Rica formerly had the gold standard, but several years ago heavy importations of silver coins of other countries set in, and gold was practically driven out of circulation. The only currency issued in the country of late years has been paper issued by the Bank of Costa Rica.

Domestic and Foreign Coins.

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

Table with 3 columns: Coin, Bid, Asked. Includes Mexican dollars, Peruvian soles, Victoria sovereigns, etc.

Other Metals.

Copper.—As foreshadowed in our last report, the market has broadened considerably, and though the transactions have not been large, they nevertheless amounted to good round quantities, and larger sales would no doubt have taken place if producers had been a little more accommodating and ready to meet the market. Early in the week Lake copper still sold freely at 11c., but since then 11 1/2c. has been paid, and at the close, we understand this price is bid with no more sellers. Other brands of copper also show a material advance, but the market is more or less irregular, and at the close we have to quote for electrolytic copper in cakes, wirebars or ingots 11c. and cathodes 10 3/4c., while early in the week transactions took place at 1/2 to 3/4c. below these figures. Casting copper continues exceedingly scarce, and the little copper which is to be had commands very high prices. Sales have been made at from 10 1/2 to 11c., according to quantity and brands. Arizona pig copper is not offered for the moment, and other raw material is also scarce. Orders for export have not been coming in very fast this week, as foreigners are not yet prepared to pay the large advance established over here, but it may be fairly assumed that they will soon be compelled to again enter our market.

G. M. B.'s abroad opened at £49 for spot and £49 10s. for three months prompt, advanced to £49 7s. 6d. for spot, and closes firm at £49 7s. 6d. @ £49 10s. for spot and £50 @ £50 2s. for three months. There has been a rather better demand for fine copper, but the higher prices asked have checked business to a considerable extent. We have to quote: English tough, £52 @ £52 10s.; best selected, £52 5s. @ £53; strong sheets, £50; India sheets, £50; yellow metal, 4 1/2d.

Tin.—The market has quieted down, and consumers do not buy more than their actual wants demand, being evidently somewhat afraid of the statistical position. We have to quote for both spot and forward 13 @ 13 1/2c. The arrivals have been rather large of late, but stocks are still very light.

In London prices opened steady at £58 10s. for spot, but during the week the market was rather flat and values gave away somewhat; closing at £58 2s. 6d. @ £58 5s. for spot and £58 17s. 6d. @ £59 for three months prompt.

Exports of tin from the Straits for the nine months ending September 30th were as follows, in tons of 2,240 lbs:

Table with 4 columns: Destination, 1894, 1895, 1896. Includes United States, Europe, India, China.

Totals..... 38,973 38,568 40,925 The exports direct to the United States, which were 14.9% of the total in 1894 and 19.7% in 1895, have risen to 27.7% this year.

Lead remains rather firm, with a good consumptive demand, which, however, is better in the Middle States than on the East Coast, where trade is not as good as was expected. Sales have been made at 2.90 @ 2.92 1/2c. In St. Louis transactions have been rather heavy, but prices somewhat irregular, from 2.65 @ 2.70c.

The foreign market is rather strong and Spanish lead is quoted £11 7s. 6d @ £11 8s. 9d., with English lead 5s. higher.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is

strong and fairly active. The latest sales were made on a basis of 2.67 1/2c. for common and 2.70 @ 2.72 1/2c. for desilverized. The undercurrent appears to be quite healthy, and from all appearances we would not be surprised to see a further elevation in the values of the metal as we go along.

Spanish Lead Market.—Messrs. Barrington & Holt write as follows from Cartagena, Spain, under date of November 1st: Notwithstanding that sterling prices have given way, the price of lead has steadily advanced, keeping pace with the jump in exchange, which is to-day quoted at 31.55 pesetas to £1. The average price of lead on wharf for October has been 58.91 reales per quintal, silver to be paid at 14.81 reales per ounce. The September average was 57.10 reales. The exports of pig lead from Cartagena in October were: To Marseilles, 2,283,858 kilos.; Antwerp, 301,001 kilos.; Newcastle, 1,446,470 kilos.; London, 250,000 kilos.; total, 6,281,329 kilos., against 4,982,171 kilos. in September. Lead ores are quoted as follows: Potters' ore, 8s. 9d. per cwt.; Linars sulphide, 6s. 8d.; Linars carbonate, 4s. 4d. per cwt., f. o. b. shipping port.

Spelter.—There is a decided improvement in the demand and higher prices have been paid. The large exports have considerably depleted stocks, while consumers have been holding back too long and have now had to buy at rather higher prices. We have to quote 3.92 1/2 @ 3.95c. delivered New York, with very small offerings.

The foreign market continues rather strong, and good ordinaries in London are quoted £17 16s. 3d. and specials £17 18s. 9d.

Antimony is about the only article on the list which remains very dull and depressed, and importers complain of not being able to realize higher figures. We have still to quote Cookson's, 7c.; U. S. Star, 6 1/2c., and Hallett's, 6 1/2c.

Nickel.—The demand is improving, and prices are firm, with no present change noted. We continue to quote 33 @ 36c. per lb. for ton lots and 37 @ 39c. for smaller orders. London prices are 14d. @ 15d. for large orders and 15d. @ 16 1/2d. for small lots. The New York price is on a parity with London, allowing for the United States duty of 6c. per lb. on the metal.

Platinum.—Demand is steady and prices are firm at \$14.50 @ \$15.50 per oz., New York. London quotations are 57s. 6d. @ 59s. per oz.

For chemical ware, best hammered metal, Messrs. Elmer & Amend, New York, furnish the following quotations, the prices given being respectively for orders of over 250 grams, for orders of over 100 grams and less than 250 grams, and for orders of less than 100 grams: Crucibles and dishes, 50c., 51c. and 52c. per gram. Wire and foil are 47c., 48c. and 49c. per gram. The current retail price for crucibles is 60c. per gram.

Quicksilver.—The New York quotation is unchanged at \$36.75 per flask. The London price is £6 12s. 6d. per flask, with £6 10s. @ £6 10s. 6d. named from second hands.

Average Monthly Prices of Metals In New York since January 1st, 1896, and for the years 1895, 1894, 1893 and 1892; in cents per pound.

Table with 6 columns: Month, 1896, 1895, 1894, 1893, 1892. Includes Copper (Lake), Tin, Lead, Spelter.

Table with 6 columns: Month, 1896, 1895, 1894, 1893, 1892. Includes Lead, Spelter.

Table with 6 columns: Month, 1896, 1895, 1894, 1893, 1892. Includes Spelter.

The Minor Metals.—Quotations for these metals are given in the table below, the prices being for New York delivery:

Table with 2 columns: Metal, Price. Includes Aluminum, Bismuth, Phosphorus, Platinum, Tungsten, Ferrotungsten.

Variations in prices are chiefly on size of order.

Imports and Exports of Metals.

Table with 5 columns: New York, Week, Nov. 5, Year, 1896. Includes Aluminum, Antimony, Brass, Copper, Iron ore, Iron pyrites, Ferro-manganese, Ferro-silicon, Manganese ore, Spiegeleisen, Lead ore, Magnolia metal, Nickel, Steel, Tin, Zinc.

* Metal Exchange Reports. † Week ending Nov. 12.

Table with 4 columns: Philadelphia, Week, Nov. 7, Year, 1896. Includes Antimony, Copper ore, Ferro-manganese, Ferro-silicon, Iron ore, Iron pyrites, Manganese ore, Spiegeleisen, Tin, Tin and black plates.

†† From New York Metal Exchange Reports.

Table with 5 columns: Baltimore, Week, Nov. 12, Year, 1896. Includes Bismuth metal, Chrome ore, Copper, Iron ore, Ferro-silicon, Lead, Limestone, Manganese metal, Spiegeleisen, Steel, Tin, Zinc.

**From our special correspondent.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Nov. 13.

Heavy Chemicals.—Prospects are better now than so many of the idle textile mills and other works have renewed operations. This is also shown by the fact that there is quite a demand for alkali and some of the other chemicals. Prices for alkali have receded somewhat, which is attributed by some to the large stocks on hand in consequence of the very light demand that has existed for some time. In bleaching powder we understand the major portion of the business done during the week consisted of forward contracts; the stocks in makers' hands on the spot are said to be very low. With few exceptions prices have been unchanged, and we quote: Caustic soda, 60%, \$2.22 1/2 @ \$2.42 1/2; 70, 74 @ 76%, \$2.12 1/2 @ \$2.37 1/2 per 100 lbs. Alkali, 58%, 70 @ 75c. for 50-ton lots and over, and 80 @ 90c. for smaller quantities; 48%, \$1 @ \$1.10 for jobbing lots. Bleaching powder, prime brands, \$1.75 @ \$1.87 1/2; Continental, \$1.65 @ \$1.75 per 100 lbs. Bicarb. soda, English, 1'60 @ 2c. per lb.; American, bulk, \$1.50 @ \$1.50 per 100 lbs. Sal-soda, English, 62 1/2 @ 67 1/2c.; American, 65c. (in barrels, 80c. (in kegs) per 100 lbs.

Hyposulphide of soda, prime white German, 1'65@1'85c. in casks; 1'75@2c. in kegs.

Acids.—Inquiries for contracts over 1897 continue to appear in the acid trade, but we hear of but few being accepted which have been taken on a basis of 10c. per 100 lbs. above current quotations. The uncertainty about prices of the raw material still makes acid manufacturers slow about taking contracts for the coming year. The demand for acids has increased this week, and the actual business done has been better than for many weeks past. The orders received outside of regular contracts are merely of a jobbing nature to fill immediate wants. We quote: Acetic acid in barrels, \$1.35 @ \$1.45; in carboys, \$1.40 @ \$1.60; muriatic acid, 18°, 75c.; 20°, 75@85c.; 22°, \$1.10 @ \$1.25, according to make and quantity. Nitric acid, 36°, \$3.25 @ \$4.36; 40°, \$4 @ \$4.50; 42°, \$4.50 @ \$5.50. Oxalic acid, \$7.25 ex-dock and \$7.50 ex-store. Mixed acids, according to mixture. Sulphuric acid, 66°, 75@95c., 10@15c. higher for small quantities. Chamber acid, \$6 @ \$6.50 per ton at factory. Blue vitriol, \$3.50 @ \$3.75 according to grade and order.

Brimstone.—The market in general is more active than it was last week; arrivals of 2,000 tons of crude brimstone are noted and prices quoted are variable. \$23 @ \$26 being asked for spot deliveries. The sulphur received this week has already been contracted for and will doubtless go into consumption immediately. At the early part of this week unmixed seconds could have been secured at \$21.50 for November and \$20.50 for December shipments; thirds about \$1 less, while on November 11th quotations for unmixed seconds were \$21.50 @ \$21.75 for December shipment, and \$1.10 less for thirds.

Fertilizing Chemicals.—All ammoniates show a sharp advance in price. There is also a much better feeling noted throughout the trade, in consequence of an increase in the number of inquiries in the market for fertilizers and of the sales made. The majority of the dealers in fertilizers have allowed their stocks to dwindle down to a minimum and they are therefore obliged to come into the market at this time for supplies. The potash salts continue steady at regular prices.

We quote: Sulphate of ammonia, gas liquor, \$2.30 @ \$2.35 for shipment, and \$2.20 on spot; bone, \$2.20 per 100 lbs. Dried blood, high grade, Western, \$1.55 @ \$1.60 per unit New York; f. o. b. Chicago, \$1.90 @ \$1.95 per unit; low grade, fine ground, Western, \$1.75 f. o. b. Chicago. Azotine, \$1.65 @ \$1.70 basis New York. Concentrated phosphate (30% available phosphoric acid), 57½c. per unit. Acid phosphate, 13% @ 15%, av. P₂O₅, 54 @ 65c. per unit at seller's works in bulk. Dissolved bone black, 17% to 18%, P₂O₅, 85c. per unit. Acidulated fish scrap, \$8.50 @ \$9, and dried scrap \$16.50 @ \$17 f. o. b. fish factory. Tankage, high grade \$15 @ \$15.50 per ton; concentrated, \$1.45 per unit f. o. b. Chicago; New York, \$1.9; low grade, \$1.2. Bone tankage, \$1.9 @ \$2.0; ground bone, \$2.2 @ \$2.50. Bone meal, \$1.9 @ \$2.1. Sulphate of Potash: 90-95%, New York and Boston, \$1.96½; Philadelphia, Baltimore and Norfolk, \$1.98; Southern ports, \$2.

Double Manure Salts: 1'03 @ 1'05½c. basis of 48% chlorine high grade (basis 80%), 1'99½ @ 2'03c., in bulk, 24 @ 36% per unit O. P., 36½ @ 38c.

Muriate of Potash.—We quote: 1'78c. at New York and Boston, 1'79½c. Philadelphia, Baltimore and Norfolk, and 1'81½c. Charleston, Savannah, Wilmington and New Orleans, for 80 @ 85% basis of 80%, in lots of 50 tons and upwards.

Kainit: Shipments per ton, \$8.80 @ \$9.25; ex-ship, in bulk, same quotation.

Nitrate of Soda.—This article has held its own fairly well during the week, and we note some sales at 1'85c. There has been an arrival this week of 23,544 sacks of nitrate, nearly all of which is destined to fill contracts previously made. The small balance will be sold in a jobbing way. Quotations given are for spot 1'82½ @ 1'85c. Futures are quoted at 1'80 @ 1'87½c.

NOTES OF THE WEEK.

The Western Fertilizer Manufacturers' Association at their recent meeting in Louisville, Ky., re-elected: A. T. Whitman, Chicago, president; W. G. Sodder, Nashville, Tenn., vice-president; H. P. Hinchman, Urbano, O., secretary and treasurer. Harmony reigned throughout the meeting, and the principal firms in the territory west of the Mississippi were represented.

Among the imports at San Francisco for the first half of 1896 we note 1,945,087 lbs. of caustic soda, 3,383,141 lbs. of soda ash, 105,800 lbs. of sal soda, 476,546 lbs. other salts of soda, 9,746 tons nitrate of soda and 1,691 tons crude brimstone.

The Dunnellon Phosphate Company, of Marion County, Florida, has recently loaded the second cargo of phosphate rock which has been sold to the Diamond Match Company. This latter company considers it economy to buy crude phosphate rock for the phosphorus it contains, instead of buying the phosphorus directly.

At the first half-yearly meeting of the Consolidated Pacific Borax & Redwood's Chemical Works Company, held in London, October 26th, the chairman stated that the net profits for the six months ending September 30th had been \$138,105. From

this dividends at the rate of 6% a year are to be paid on both the preferred and ordinary stocks, leaving a good working balance on hand. The mines in California were reported in excellent condition.

Liverpool. Nov. 4.
(Special Report of Joseph P. Brunner & Co.)

The success of the sound-money party at your side has been hailed with satisfaction here, and it is hoped now that the presidential election is over, trade generally will benefit. In chemicals the market is better in tone, while caustic soda for 1897 delivery is the principal feature, makers having all withdrawn pending the result of the negotiations now proceeding regarding combination arrangement.

Soda Ash—A large inquiry is reported for ammonia soda over 1897, but the only change in quotations, so far, is an advance of 7s. 6d. per ton for export to the Continent of Europe. We quote spot range for tierces, as to market, about as follows: Leblanc ash, 48%, £4 @ £4 5s; 58%, £4 5s @ £4 10s. per ton, net cash; ammonia ash, 48%, £3 @ £3 10s.; 58%, £3 5s. @ £3 15s. per ton, net cash. Bags 5s. per ton under price for tierces.

Soda crystals are steady at £2 5s. @ £2 7s. 6d. per ton, less 5% for barrels, and 7s. less for bags.

Caustic soda is firmer on spot, although not notably higher. For 1897 delivery the position is much stronger, but makers are declining to quote pending the result of the negotiations proceeding with regard to combination between English and foreign manufacturers. Some resales have been made over next year at 7s. 6d. per ton above prices current a week ago. On spot we quote range as to market as follows: 60%, £6 @ £6 5s.; 70%, £7 @ £7 5s.; 74%, £8 @ £8 5s.; 76%, £8 15s. @ £9 per ton, net cash.

Bleaching powder is reported to be in rather better demand, and hardwood ranges from £6 12s. 6d. @ £6 17s. 6d. per ton, net cash, as to destination. Chlorate of potash is very quiet, and the price quite nominal at 4d. per lb. Bicarb. soda continues firm at £6 15s. per ton, less 2½% for the finest quality in 1-cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia has improved, and is now quoted at £7 10s. @ £7 12s. 6d. per ton, less 2½%, for good gray, 24 @ 25% in double bags f. o. b. here, as to quality.

Nitrate of soda is held for £8 @ £8 2s. 6d. per ton, less 2½% for double bags, f. o. b. here according to quality.

Carb. ammonia, lump, 3d. per lb.; powdered, 3¼d. per lb., less 2½%.

MINING STOCKS.

Complete quotations will be found on pages 478 and 479 of mining stocks listed and dealt in at: New York, Colorado Springs, Paris, France. Boston, Duluth, Minn., Mexico. Philadelphia, Helena, Mont., Shanghai, China. Baltimore, Salt Lake, Utah, Valparaiso, Chile. Pittsburgh, San Francisco, London, England. Cleveland, page 476 Denver, Colo., British Columbia.

NEW YORK, Friday Evening, Nov. 13.
The opening days of this week have seen a better feeling in the mining stock market, with prices somewhat higher. The total sales made amounted to 14,250 shares. Interest, however, slackened at the close. The Comstocks were generally dull. Only six stocks were traded in. Mexican receded three points, selling at 47c. on Monday. Savage opened at 70c. and dropped to 60c. on Wednesday. Yellow Jacket showed a falling off of 20c. from two weeks ago, when it sold as high as 70c.

Standard Consolidated, one of the California stocks dealt in this week, shows considerable buying at \$1.40 @ \$1.50. The reason given for this selling is that some stockholders have become dissatisfied at the increase in the capital stock; but others are buying all the stock offered. Of Brunswick we note it has fallen to 20c., selling price of 200 shares, while as low as 17c. is being bid for it. Bulwer Consolidated, another California stock, rose to 46c. this week, against 42c. at the close last week; it is soon to be consolidated with the Standard.

Of the Colorado stocks, the Cripple Creek group has ruled a little higher in price as compared with last week; Cripple Creek Consolidated sold for 18c. at the close to-day. Sales of this class of stocks have been heavier. Of the other Colorado's Iron Silver has reappeared on the exchange, 40c. being the selling price of 100 shares. The Portland Mining Company of Cripple Creek declared its regular dividend of 1c. per share on November 5th, payable November 15th. The Iowa Gold Mining and Milling Company, of Silverton, Colo., paid a dividend on October 15th of 1c. per share, or \$60,000. The Elkton Consolidated Mining Company decided at its special meeting recently to increase its board of directors from five to seven. Messrs. Louis R. Ehrich and Baron de Bellecize, a French mining engineer, are the two newly elected directors.

At a special meeting of the Board of Directors of the Ben Hur Mining and Milling Company, held at the office of the company in Colorado Springs, Colo., it was unanimously decided to lease to the Good Will Mining and Tunneling Company a strip of ground 400 ft. wide along the line of the Good Will tunnel, which will strike the Ben Hur property at a depth of about 400 ft. This makes six leases now in existence on various portions of the Ben Hur territory. The Ben Hur Mining Company has a number of other properties which it is now making preparations to lease.

The Utah stock, Ontario, traded in this week has been absent from the Exchange for some time. It

has held its selling price, nevertheless, up to \$10, with bidders at the close to-day at \$7.

The Bullion Gold and Silver Mining Company of Montana will hold a meeting in Anaconda on November 21st to act upon the proposition as to whether it shall sell all its property and mining claims in Granite County, Mont.

Boston. Nov. 12.

The market for copper stocks the past week has shown a good degree of activity and prices are higher all round. Boston & Montana has supplied a good share of the business and advanced from \$88½, the closing price of last week, to \$94½ and lost only the fraction in the final dealings to-day.

Butte & Boston has come into activity again and the trading in it has been quite large. It opened at \$3 and advanced to \$5½, receding later to \$4, but to-day was strong again, selling up to \$5½ and closing at \$4½.

Calumet & Hecla advanced to \$325, and was firm at the price. Quincy advanced from \$120 to \$125 on announcement of an extra dividend of \$6 per share. The scrip sold at \$90. Tamarack did not quite hold the advance of last week, but sold at \$100 and in demand at that price. Old Dominion advanced from \$16½ to \$18 and closed strong. Osceola opened at \$29 and sold up to \$30½. Kearsarge touched \$13½ in early trading, advanced to \$16 and closed there. Franklin advanced from \$10½ to \$12, and Atlantic from \$20 to \$23. Tamarack, Jr., sold at \$13 @ \$14½ for small lots. Wolverine advanced from \$8 to \$8½ and in good demand. Tecumseh steady at \$3½. Arnold declined from \$1¼ to 75c. and Allouez sold at 85c.

The gold stocks have been fairly active, with Pioneer as leader. This stock sold at \$8 and declined to \$6½ in later dealings. There is talk of a foreign syndicate buying control of the mine. Santa Ysabel declined from \$10 to \$9½, but rallied later to \$9½. Gold Coins steady at about \$3. Merced advanced ½ to \$8½, and Boston & Cripple Creek from 15 to 17½c.

The market closed firm.

Cleveland. Nov. 11.

(From Our Special Correspondent.)

The mining stock market has improved considerably in this city during the past week, and the brokers are of the opinion that much business will be done during the winter and spring. Minnesota has been marked up 50%, while Chandler and Pittsburgh & Lake Angeline have dropped slightly. Quite a number of inquiries have been made at the offices of the brokers during the past week, but no large sales are reported. Following are the quotations:

Name of Company.	Par val.	Nov. 4.	
		Bid.	Ask.
Aurora.....	\$25	\$6.00	\$8.00
Biwabik.....	100	34.00	34.00
Champion Iron Company.....	100	10.00	30.00
Chandler.....	25	30.00	30.00
Cincinnati Iron.....	25	10.00	13.50
Cleveland-Cliffs Iron Company.....	100	15.00	.....
Jackson Iron Company.....	25	70.00	75.00
Lake Superior Iron Company.....	25	25.00	25.00
Lake Superior Consolidated.....	100	21.00	21.00
Minnesota.....	100	65.00	65.00
Pittsburg & Lake Angeline.....	25	72.00	72.00
Republic Iron Company.....	25	16.00	.....

Salt Lake City. Nov. 7.

(Special Report of James A. Pollock.)

The stock market has been wholly neglected for the current week, and until the smoke of the political battle is cleared away there will be no activity. As has been the case for the past several weeks, Ajax was strong and transfers made were at figures not lower than those of the previous week. Alliance and Anchor were weak, with practically nothing doing in them. Bullion-Beck registered no change either way. A rather important development on the 900-ft. level is reported, but the work done has not as yet demonstrated the extent of the strike. Centennial-Eureka was also unchanged, with light offerings of the stock. Daly-West was offered slightly lower, although the demand for the stock was heavy, with no great offerings. Its neighbor, the Daly, was about stationary. Dalton and Dalton & Lark were quiet, with weaker tendencies. East Golden Gate was a drug on the market at last week's figures, the temporary demand having evidently been satisfied. The work of enlarging the milling capacity of the Geyser is now under way. The stock did not reflect the changes for the better in the condition of the company's affairs, there being only a limited demand. Notwithstanding the improvements at the Horn Silver the stock continues inactive. Lucky Bill is reported to be getting some good gold ore out of the 3-ft. vein recently encountered. Mercur stock was much stronger and made good advances. Reawakened fears for the Mammoth's November dividend caused that stock to weaken materially, offerings being made at lower figures. Ontario paid its regular dividend on the last day of October. Swansea will pay its November dividend of 5c. November 10. Both it and South Swansea were slightly shaded. Sunbeam did not change much. Utah came on the market with a shipment of very high-grade ore and the mines are looking very well.

San Francisco.

Nov. 7.

(From Our Special Correspondent.)

Election-day holiday came in this week to intensify the usual dullness, and less than usual can be recorded. The only incident was a sharp decline in the Brunswicks on Friday, from which there has been very little reaction. The week might as well have been left out altogether so far as stock transactions were concerned.

Some quotations are: Chollar, \$1.75; Consolidated California & Virginia, \$1.70@1.75; Hale & Norcross, \$1.20@1.25; Ophir, \$1.20@1.25; Confidence, \$1@1.05; Best & Belcher, \$7@90c.

The Gold Mining Exchange continues extremely quiet. The only quotations noted are: Savannah, 46@48c.; Lockwood, 27@28c.

The sales on regular call at the San Francisco Stock Board for the first 10 months of the year were as follows:

Table with 3 columns: Month, 1895, 1896. Rows include January through October, and a Total row.

For the same time in 1895 the sales were 3,445,385 shares.

The monthly returns filed November 1st by the companies show that the following had money on hand: Ander, \$6,775; Alta, \$5,043; Alpha Consolidated, \$7,306; Belcher, \$13,733; Best & Belcher, \$11,408; Bullion, \$6,835; Bodie Consolidated, \$991; Bulwer Consolidated, \$8,775; Church, \$10,957; Consolidated New York, \$961; Consolidated California & Virginia, \$12,525 of unsold bullion, with further shipments to come, and with indebtedness at bank of \$2,248, and the monthly expenses to be paid. It is expected that the proceeds of the bullion yield for the past month will pay all the expenses and leave a small balance in the treasury. Crown Point, \$10,249; Chollar, \$10,388; Confidence, \$5,258; Challenge Consolidated, \$87; Consolidated Imperial, \$2,713; Caledonia, \$4,079; Exchequer, \$1,016; Gould & Curry, \$7,465; Hale & Norcross, \$195 in cash, and on the coin value of which is estimated at \$6,000, to meet the monthly expenses; and a note of \$10,000 at the Bank of California; Julia Consolidated, \$23; Lady Washington Consolidated, 32c., with an indebtedness of \$510; Mexican, \$394, with \$500 due the bank; Mono, \$1,251; Occidental Consolidated, \$2,157 in cash, with the monthly expenses and the company's note for \$2,500 due the Nevada Bank; Ophir, \$16,053; Overman, \$499; Potosi, \$9,423; Savage, \$909; Sierra Nevada, \$18,746; Silver Hill, \$564; Standard Consolidated, \$27,292; Syndicate, \$640; Segregated Belcher, \$159; Union Consolidated, \$16,597; Utah Consolidated, \$3,552.

The Silver King Mining Company has an indebtedness of \$658 and is collecting an assessment of 25c. per share.

The Morning Star Mining Company, of Elko County, Nevada, has levied an assessment of 1/2c. per share, delinquent December 2d.

The annual meeting of the Challenge Consolidated Mining Company has been called for November 18th.

British Columbia.

(From Our Special Correspondent.)

ROSSLAND, B. C., Nov. 4.

The progress of the camp shows little or no diminution with the approach of winter, a premonition of which the camp has been experiencing for some days past. Traffic and travel have been greatly impeded by the condition of the roads. There are two subjects which appear to be pre-occupying the attention of smelting and mining people alike. These are increased facilities in the camp for smelting and the matter of reducing low-grade ores.

As to the smelters it would seem to be a settled fact that the management of the Trail Creek smelter has decided to treble its present capacity.

As to the low-grade ores, of which there is a superabundance in the camp, I have been informed that there is now a movement in that direction which will be materialized next spring. Rumors of changes in ownership of two or three of the larger mining concerns of the camp continue to be revived from time to time, but so far there is a complete absence of the verification. It has been so far impossible to make any reliable or satisfactory estimate of the actual money investments made in the camp since April 1st, 1896, but an approximate estimate is in course of preparation. The amount is certainly very large.

Paris.

Nov. 1.

(From Our Special Correspondent.)

Foreign politics and the Russian alliance continue to be the main topics of discussion, so that mining stocks have been somewhat neglected.

The market for the South African gold stocks continues very dull and a steady decline in prices is still apparent. The selling movement is not quite so strong, perhaps because of the warnings which have been addressed to holders. They are quite ready to sell, but are afraid to hasten a decline should they press the stocks they would like to be rid of on the market.

The zinc shares generally continue to hold their

prices well. The lead companies also show but little change, though Laurium has dropped a little.

The copper stocks still remain strong, and they are likely to continue so, as there is every prospect that the demand for the metal will be well maintained next year, and that good prices will continue.

Above all, the metallurgical shares are in demand. It is certain that the railroad companies are going to be heavy buyers of rails and other forms of iron and steel in 1897. The shipyards are busy, and there are prospects that our companies may secure orders for the Japanese Navy. Even without that the iron and steel makers are preparing for a period of prosperity, which from all appearances will last for some time.

In fact, we are all looking forward to a period of prosperous trade. And just now we are waiting with much interest for the result of your elections, upon which we believe that your prosperity depends. The world is closely united now, and we cannot do well here in Europe while your country is in a state of depression.

The Russian excitement has, as one might have expected, increased the interest in everything pertaining to our great Northern ally. We are all convinced that Russia is the country of the future, and are ready to invest in Russian enterprises, which promise so much in a rapidly growing country. I hear of several new companies to be brought out to work Russian mines and to establish iron and steel works in that country. A good deal of French money is invested there already and a good deal more will probably go there before long.

One enthusiast even proposes to establish summer resorts on the line of the Siberian Railroad. It is well; perhaps in a few years one may, instead of starting for Trouville or Geneva, be buying his railroad tickets for Irkutsk, or Tomsk, or Vladivostok, and may take his summer bath in the Obi, the Lena or Lake Baikal.

London.

Oct. 31.

(From Our Special Correspondent.)

The London mining stock market continues to be quite lifeless. There is a total disinclination on the part of the public either in France or England to buy mining shares of any kind, and bulls are making desperate efforts to get rid of their holdings. The chief battle-ground during the past week has been in the shares in deep-level companies of the Transvaal. All kinds of rumors have been current as to the expected poor results at several of the deep-level mines, and these rumors have gained so much ground that some of the large promoting companies, such as the Exploration Company, have thought it expedient to make public announcements contradicting them, and stating that there is no reason for the public to be scared about the future of the deep levels. From reliable sources, I am disposed to think there is a great deal of truth in these adverse rumors and that the world will be astonished at no distant period at the poor results of the deep-level mining.

There has been a good deal of speculative buying and selling of Consolidated Gold Fields. Although, as I reported last week, this company has just declared a dividend of 125% per annum with a very large balance held over, the bears have made great efforts to depress the shares, and success has attended them. Reports such as, that the dividend has not been earned, that the directors were divided in opinion as to this, that and the other, have been diligently circulated. As this company is intimately connected with deep levels it is natural to expect some depression in the shares in spite of the handsome dividend.

In other sections of the mining market depression has reigned in sympathy with the South Africans. West Australians are gradually dropping on the adversities of mining in that colony, while Indians and New Zealanders are suffering from neglect.

Americans are not heard of and British Columbians are in the background. Several promoters and vendors tell me confidently that their companies to work British Columbian mines are coming out in a few days, but it remains to be seen whether they will not alter their minds and put off the flotation until a more opportune season comes along.

MEETINGS.

Alma Gold Mining Company, at the office of the company, 104 Main street, Salt Lake City, Utah, on December 5th.

Boss Tweed Mining Company, at 212 Main street, Salt Lake City, Utah, on November 28th, at 10 a. m.

Bullion Gold and Silver Mining Company, in Petritz Building (Room 1), Anaconda, Mont., on November 21st, at 8 p. m.

Difficult Creek Gold Mining and Milling Company, at the office of the company, Aspen Block, Aspen, Colo., on November 27th, at 2 p. m.

Gambetta Gold Mining and Milling Company, in Mining Exchange Building (Room 521), Denver, Colo., on November 21st, at 3 p. m.

Lucky Bill Gold Mining Company, at 420 Equitable Building, Denver, Colo., on November 18th, at 3 p. m.

People's Mining and Milling Company, at Mining Exchange Building (Room 308), Denver, Colo., on November 18th, at 2 p. m.

ASSESSMENTS.

Table with 5 columns: Name of Co., Loc'n., No., Dinq., Sale, Amt. Lists various mining companies and their assessment details.

* New assessment.

DIVIDENDS.

Table with 4 columns: NAME OF COMPANY, Current Dividends (Date, Am't.), Paid since Jan. 1, 1896, Total to date. Lists companies and their dividend payments.

* October dividend paid. † Extra dividend of \$1 per share included.

NOTE.—This table does not give all the dividends paid by mining companies, as it is impossible to obtain a complete list of dividends declared. Many companies are close corporations and refuse to give the information. Readers of the Engineering and Mining Journal will confer a favor on the publishers if they will notify the Journal of any errors or omissions in the above table.

STOCK QUOTATIONS.

BOSTON, MASS.*

Table of stock quotations for Boston, Mass. listing companies like Allouez, Arnold, Atlantic, etc., with columns for location, par value, and prices for various dates from Nov 6 to Nov 12.

*Official quotations Boston Stock Exchange. †Holiday. ‡Ex-dividend. Total sales, \$8,595.

NEW YORK.*

Table of stock quotations for New York listing companies like Ajax, Alamo, Alliance, etc., with columns for location, par value, and prices for various dates from Nov 7 to Nov 13.

*Official quotations N. Y. Stock and Con. Stock & Petroleum Exchs. Total shares sold, 11,270.

INDUSTRIAL COAL AND COAL RAILROAD.*

Table of stock quotations for Industrial Coal and Coal Railroad listing companies like Alt. & Ohio, Ches. & Ohio, Col. C. & I. Dev., etc., with columns for par value and prices for various dates from Nov 7 to Nov 13.

*Official quotations N. Y. Stock Exchange. †Holiday. Total shares sold, 424,077.

COLORADO SPRINGS, COLO.†

Table of stock quotations for Colorado Springs, Colo. listing companies like Ajax, Alamo, Am. Iron, etc., with columns for par value and prices for various dates from Nov 2 to Nov 7.

† Official quotations and sales Colo. Springs Mfg. Stock Assoc. * Board of Trade Exchange. † Holiday.

SAN FRANCISCO, CAL.*

Table of stock quotations for San Francisco, Cal. listing companies like Alta, Belcher, Best & Belcher, etc., with columns for location, par value, and prices for various dates from Nov 7 to Nov 12.

* Official telegraphic quotations, San Francisco Stock Exchange.

BALTIMORE, MD.*

Table of stock quotations for Baltimore, Md. listing companies like Balt. M. & S. N. C., Conrad Hill, etc., with columns for location, par value, and prices for various dates from Nov 7 to Nov 12.

* Official quotations Baltimore Stock Exchange.

BRITISH COLUMBIA.*

Table of stock quotations for British Columbia listing companies like Houndy Creek, Trail Creek, etc., with columns for name, selling price, and price for various dates from Oct 21 to Nov 12.

Par val.: Half Mines and Le Rol, \$5; Slocan Star, 5¢; other stocks, \$1.

LONDON. Oct. 30

Table with columns: NAME OF COMPANY, Country, Product, Capital stock, Par value, Dividend, Last dividend, Quotations, Buyers, Sellers. Includes entries for N'th Americans, Alaska-Mexican, De Lamar, etc.

* Dividend pending. † Ex-dividend.

PARIS. Week ending Oct. 22.

Table with columns: NAME OF COMPANY, Country, Product, Capital Stock, Par value, Div. last year, Prices, Op'n'g, Closing. Includes entries for Acleries de Creusot, Firminy, Pives-Lille, etc.

MEXICO. Week ending Nov. 5.

Table with columns: NAME OF COMPANY, State, No. of shares, Last dividend, Last assessment, Prices, Opening, Closing. Includes entries for Amistad y Concordia, Guanaxuato, Angustias, etc.

NOTE.—In most Mexican mining companies the shares have no fixed par value. The capital is formed of a certain number of shares, the total value not being named. Prices are in Mexican dollars.

VALPARAISO, CHILE. Sept. 3.

Table with columns: NAME OF COMPANY, Capital, Share value, Last dividend, Prices, Bid, Asked, Last sale. Includes entries for Arturo Prat, Caracoles, Descub. de Huantajaya, etc.

* Special Report of Jackson Bros. Values are in Chilean pesos or dollars.

SHANGHAI, CHINA. Oct. 18.

Table with columns: NAME OF COMPANY, Country, No. of shares, Value, Last dividend, Price. Includes entries for Jelebu Mfg. & Trad., Funjom Mfg. Co., etc.

* Special Report of J. P. Bissett & Co. The prices quoted are in Shanghai taels.

DENVER, COLO. Nov. 2.

Table with columns: NAME OF COMPANY, Par val, Nov. 2, Nov. 3, Nov. 4, Nov. 5, Nov. 6, Nov. 7, Sales. Includes entries for L'd Mines, Anaconda, Bannock, etc.

* Official quotations Colo. M. & S. Exch. Sales listed, \$2,311,710; unlisted, 719,900; total, \$3,031,610. † Holiday.

SALT LAKE CITY, UTAH. Week ending Nov. 7.

Table with columns: STOCKS, Par value, Bld, Asked, Actual selling price. Includes entries for Max, Alliance, Annie, etc.

* Special Report of James A. Pollock. † All the companies are located in Utah.

PHILADELPHIA PA. Nov. 11.

Table with columns: NAME OF COMPANY, Location, Par value, Nov. 5, Nov. 6, Nov. 7, Nov. 9, Nov. 10, Nov. 11, Sales. Includes entries for Cambria Iron, Choc. & C. Co., etc.

* Official quotations Philadelphia Stock Exchange. † Ex-dividend. Total sales, 21,905.

HELENA, MONT. Week ending Oct. 24.

Table with columns: NAME OF COMPANY, Location, Company's office, Par value, Bld, Asked, Shares sold, Price. Includes entries for Am. Dev. & M. Co., Bald Butte, etc.

* Special Report of Samuel E. Davis. Total shares sold, 6,000.

PITTSBURG, PA. Week ending Nov. 7.

Table with columns: NAME OF COMPANY, Location, Par val, Bid, Ask, Selling price. Includes entries for COAL: Mansfield, N.Y. & C. Gas Co., etc.

* Official quotations Pittsburg Stock Exchange.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns: Name and Location of Company, Capital Stock, Shares (No., Par Val), Assessments (Total Levied, Date and Amount of Last), Dividends (Total Paid, Date and Amount of Last), Name and Location of Company, Capital Stock, Shares (No., Par Val), Assessments (Total Levied, Date and Amount of Last).

G., Gold. S., Silver. L., Lead. C., Copper. B., 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 \$42,390,000. ‡ Dividends paid since consolidation. NOTE.—Corrections to this table are made monthly. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.

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Air Compressors and Rock Drills. American Diamond Rock Drill Co. Ballou, H. C. Mfg. Co. ...

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POSITIONS VACANT. 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.

1486 WANTED.—A MAN TO TAKE ENTIRE charge of a mining property in Mexico; must be a first-class man and thoroughly conversant with the management of Huntington Mills and chlorination; one who speaks Spanish preferred; permanent engagement, with good prospects, given to first-class man. Address **INDEPENDENCIA, ENGINEERING AND MINING JOURNAL.** Sept. 12.

1488 WANTED—AN ENGINEER AND Assayer who has had experience in the mines of the Ouro Preto District, Brazil. Address with full particulars, **F. F. F., ENGINEERING AND MINING JOURNAL.** Sept. 19.

1489 WANTED—A MAN ACQUAINTED with lead smelting, sweep smelting, cupellation and refining and desilverizing processes, to run a small blast furnace and refinery in South Africa. A technical graduate preferred, but practical experience absolutely necessary, as well as tact and ability to manage men. A man between 30 and 40 years of age preferred. A good salary will be paid to the right party, who will be expected to return it in a responsible position. Address **TRANSVAAL, ENGINEERING AND MINING JOURNAL.** Sept. 19.

1492 WANTED—A YOUNG MAN WHO is competent as an analytical chemist, with some experience as an engineer, can find a situation at a moderate salary with a mining company in Virginia, by furnishing satisfactory testimonials of his character, ability and experience. Address **MINING COMPANY, ENGINEERING AND MINING JOURNAL.** Sept. 26.

1494 WANTED, AT ONCE—A MAN WHO thoroughly understands the Metallurgy of Sulphur. Must be competent in every respect and be able to give details in the erection of a plant for treating sulphur. The mine is in Idaho and is only a recent discovery. The proper man will receive satisfactory remuneration. Address **IDAHO, ENGINEERING AND MINING JOURNAL.** Oct. 3.

1495 WANTED—AN EXPERIENCED mining superintendent; also several miners; only sober, energetic, intelligent men need answer. Address **BOLIVIA, ENGINEERING AND MINING JOURNAL.** Nov. 7.

1496 WANTED—A TECHNICAL AND practical mining engineer, assistant to superintendent. Should have mechanical ability. State age, experience and salary expected. Address **CONSOLIDATED, ENGINEERING AND MINING JOURNAL.** Nov. 14.

1497 WANTED—ASSAYER AND Draughtsman. Position open West for an energetic, technical graduate, as assistant engineer to manager. Great variety of work outside and in office. Give references, age and experience. Address **L. G., ENGINEERING AND MINING JOURNAL.** Nov. 14.

SITUATIONS WANTED.

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

ASSAYER AND CHEMIST, GRADUATE of Northwestern University, '95, desires position; experience limited; best of references. Address **N. W. U., ENGINEERING AND MINING JOURNAL.** No. 17,842, Nov. 21.

CHEMIST, UNIVERSITY GRADUATE, experienced in all kinds of metal-work, wants position. Satisfactory references. Address **ANALYST, ENGINEERING AND MINING JOURNAL.** No. 17,847, Nov. 21.

CHEMIST AND ASSAYER WISHES POSITION with cyanide company; has had smelter experience. First-class references. Address **CYANIDE, ENGINEERING AND MINING JOURNAL.** No. 17,846, Nov. 28.

GRADUATE MINING ENGINEER WANTS position; five years' experience in assaying, surveying and general mining and engineering; speaks Spanish. Address **S. E. M., ENGINEERING AND MINING JOURNAL.** No. 17,848, Nov. 21.

YOUNG MAN NOW IN NEW YORK, thorough technical education, surveyor and draughtsman, experienced in Colorado mining, desires position as assistant to mining engineer or manager. Address **H. F., ENGINEERING AND MINING JOURNAL.** No. 17,854, Nov. 21.

METALLURGIST AND MINING ENGINEER would like a position with company intending to adopt the cyanide process, or with company using it with unsatisfactory results. References. Address **CYANIDE, ENGINEERING AND MINING JOURNAL.** No. 17,843, Dec. 5.

A PARIS ENGINEERING AGENT, REPRESENTING in France an important cotton-belt company, desires to represent American manufacturers of patent articles, such as tools, wood split pulleys, etc. First-class references. Apply, with particulars, to **H. AUTRAN, 21 Mincing Lane, London, E. C.** No. 17,858, Dec. 12.

ASSAYER AND MILL SUPERINTENDENT wants position; eight years' practical experience in laboratory and as superintendent of gold and silver mill. Experienced also in ore sampling. Best of reference as to character and ability. Address **J. F., ENGINEERING AND MINING JOURNAL.** No. 17,857, Dec. 12.

EXPERIENCED CHEMIST, GRADUATED in Germany, 9 years in chemical works, in the fat industry and mines and smelting works in Europe and United States, wishes to change his position. Can do analytical, synthetic and technical chemical work of every kind. Best references. Address **N. W., ENGINEERING AND MINING JOURNAL.** No. 17,851, Nov. 28.

A MECHANICAL ENGINEER, 34 YEARS of age, who has for the last three years conducted an office of his own as Consulting and Contracting Engineer, having met with financial reverses, desires a position as general manager or superintendent; is largely experienced in the design and construction of high-grade engines, special tools and general machinery, and is competent to handle men and work systematically; open for immediate engagement. Address **ENGINEER, ENGINEERING AND MINING JOURNAL.**

OPEN TO ACCEPT ENGAGEMENT JANUARY 1st, 1897—a man having 16 years' practical experience in the planning and supervision of the development and equipment of gold and silver mining property, with plants of mining and reduction machinery, and the management of extensive mining and milling operations, and who is well abreast of modern up-to-date practice in the principal and incidental departments of precious-metal mining, including the handling of men in the vigorous and systematic prosecution of mining work. Reference as to moral character and ability given. Address **A. Z., ENGINEERING AND MINING JOURNAL.** No. 17,840, Nov. 21.

Contracts Open.

TREASURY DEPARTMENT, OFFICE SUPERVISING Architect, Washington, D. C., November 9th, 1896.—Sealed proposals will be received at this office until 2 o'clock p. m. on the 22d day of December, 1896, and opened immediately thereafter, for all the labor and materials required for the low pressure, return circulation, steam heating and ventilating apparatus and power boiler for the U. S. Marine Hospital Building at Port Townsend, Wash., in accordance with the drawings and specification, copies of which may be had at this office or the office of the Custodian at Port Townsend, Wash. 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. **WM. MARTIN AIKEN, Supervising Architect.** Orig.

TREASURY DEPARTMENT, OFFICE SUPERVISING Architect, Washington, D. C., November 18th, 1896.—Sealed proposals will be received at this office until 2 o'clock p. m. on the 16th day of December, 1896, and opened immediately thereafter, for furnishing all the labor and materials required to put in place complete all the plumbing and gas-piping for the U. S. Post Office Building at Pueblo, Colo., in accordance with the drawings and specification, copies of which may be had at this office or the office of the Superintendent at Pueblo, Colo. 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 bids received after the time stated for opening the same will be returned to the bidders. **WM. MARTIN AIKEN, Supervising Architect.** Orig.

STEEL RAILS.—Supply of 150,000 tons of steel rails and other permanent way materials, to be manufactured in the Colony of New South Wales and are hereby invited by the Government of New South Wales and will be received by the Secretary for Public Works in Sydney, and the Agent-General for New South Wales, in London, until December 30th, 1896, from persons willing to contract for the supply of 150,000 tons of steel rails and the necessary quantity of fish-plates, fish-bolts and spikes, manufactured in the Colony of New South Wales, out of iron ore and other necessary materials, the natural product of, and with coal, coke or other fuel, smelted, gotten and raised within the said colony, upon the terms and conditions which can be seen at the offices of the Minister for Public Works, Sydney, or the Agent-General for New South Wales, London. **J. H. YOUNG, Minister for Public Works.**

CORAL EXCAVATION.—Honolulu, Hawaii—Sealed proposals will be received at the office of the Minister of the Interior of the Republic of Hawaii, at Honolulu, until December 31st, 1896, for the excavation of the hard coral in a slip to be constructed in the Harbor of Honolulu. Plans and specifications at the office of the Hawaiian Consulates at New York, San Francisco, California and Victoria, B. C., and also at the office of the Superintendent of Public Works, Honolulu. The Minister of the Interior does not bind himself to accept the lowest or any bids. **J. A. KING, Minister of the Interior, Interior Office, Honolulu.**

MACADAMIZING—The Shore Road Commission, room No. 1, City Hall, Brooklyn, N. Y.—Sealed proposals will be received by the Shore Road Commission at its office, until November 25th, when said proposals will be opened and announced, for work to be done under "The Shore Road Construction Plan, No. 1, from Bay Ridge avenue to Third avenue," including maintenance, watering and cleaning for a period of three years after the final acceptance of the work, in accordance with the plans and specifications on file at the office of the engineer in charge, Edwin C. Swezey, Third avenue and Thirty-ninth street, Brooklyn. Proposals must be in writing, on the blank form for proposals furnished by the engineer, and must be accompanied by a certified check for one thousand dollars (\$1,000) drawn payable to the order of the President of the Commission. The right to reject any and all proposals is reserved by the Commission. A bond will be required from the successful bidder for the faithful performance of his contract. Proposals to be directed to The Shore Road Commission, and endorsed "Proposals for Work to be done under Construction Plan No. 1." **ELIJAH R. KENNEDY, President.**

WATER-WORKS.—St. Augustine, Fla.—Sealed proposals for all material and labor required in the construction of a system of water-works for the City of St. Augustine, Fla., will be received by the Secretary of the Board of Bond Trustees, at his office in St. Augustine, until the 19th day of November. Plans and specifications may be seen at the Secretary's office, on and after November 2d. **B. GENOVAR, Chairman, St. Augustine, Fla.; J. N. HAZLEHURST, Engineer, Atlanta, Ga.**

CAST-IRON PIPE.—Chief Engineer's Office, Water Department, City Hall, Baltimore, Md.—Sealed proposals will be received at this office until November 16th for 26,000 tons more or less cast-iron water pipe. Specifications of quantities, character of pipe, time of delivery, etc., can be obtained upon application to this office after Monday, November 2d, 1896. The Department reserves the right to reject any or all bids. By order of the Water Board, **WM. L. KENLY, Chief Engineer.**

BREAKWATER.—U. S. Engineer's Office, 1428 Arch street, Philadelphia, Pa.—Sealed proposals in triplicate, will be received here until December 10th, 1896, and then publicly opened, for constructing stone breakwater in Delaware Bay, Del. Information furnished on application. **C. W. RAYMOND, Major, Engrs.**

ARTESIAN WELL.—United States Engineer Office, Charleston, S. C. Sealed proposals for boring Artesian Well on Sullivan Island, S. C., near Fort Moultrie, will be received here until November 30th. Information furnished on application. **FREDERICK V. ABBOT, Captain of Engineers.**

WATER-WORKS, Snow Hill, Md.—Bids will be received by the Mayor and Council until November 30th, 1896, for the erection and completion of a system of water-works for said town. Specifications can be obtained on application. The plans can be seen at the office of the Secretary. Address **E. S. Dashiell, Sec. and Treas.**

THE ENGINEERING AND MINING JOURNAL

ADVERTISING RATES.

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	12	1	3	8	20	32	42	57
	15	1 1/4	4	11	29	42	57	73
	18	1 1/2	4	11	29	42	57	73
	21	1 3/4	5	12	33	58	78	100
	24	2	5	14	38	66	89	113
	27	2 1/4	6	16	42	72	96	125
	30	2 1/2	6	17	46	79	108	137
	33	2 3/4	7	19	50	86	117	149
	36	3	8	20	54	93	126	161
	39	3 1/4	9	21	58	99	135	173
	42	3 1/2	9	23	61	106	143	185
	45	3 3/4	10	24	65	112	151	197
	48	4	10	25	68	118	159	209
	54	4 1/2	11	28	75	129	180	243
	60	5	12	30	81	141	205	281
	66	5 1/2	13	32	87	151	219	297
	72	6	14	35	93	161	232	306
	78	6 1/2	15	37	99	171	242	313
	84	7	16	39	105	181	258	329
	90	7 1/2	17	41	109	190	264	340
	96	8	18	43	115	200	271	348
	102	8 1/2	18	45	121	209	284	361
	108	9	19	47	126	219	296	385
	114	9 1/2	20	49	132	228	309	411
	120	10	21	51	137	238	322	428
	126	10 1/2	21	53	143	248	336	446
	135	11 1/4	22	55	149	258	349	464
	144	12	23	57	155	268	363	482
	150	12 1/2	24	59	161	278	376	500
	156	13	25	61	167	288	390	518
	162	13 1/2	26	63	173	298	404	536
	168	14	27	65	179	308	418	554
	174	14 1/2	28	67	185	318	432	572
	180	15	29	69	191	328	446	590
	186	15 1/2	30	71	197	338	460	608
	192	16	31	73	203	348	474	626
	198	16 1/2	32	75	209	358	488	644
	204	17	33	77	215	368	502	662
	210	17 1/2	34	79	221	378	516	680
	216	18	35	81	227	388	530	698
	222	18 1/2	36	83	233	398	544	716
	228	19	37	85	239	408	558	734
	234	19 1/2	38	87	245	418	572	752
	240	20	39	89	251	428	586	770
	246	20 1/2	40	91	257	438	600	788
	252	21	41	93	263	448	614	806
	258	21 1/2	42	95	269	458	628	824
	264	22	43	97	275	468	642	842
	270	22 1/2	44	99	281	478	656	860
	276	23	45	101	287	488	670	878
	282	23 1/2	46	103	293	498	684	896
	288	24	47	105	300	508	698	914
	294	24 1/2	48	107	306	518	712	932
	300	25	49	109	312	528	726	950
	306	25 1/2	50	111	318	538	740	968
	312	26	51	113	324	548	754	986
	318	26 1/2	52	115	330	558	768	1004
	324	27	53	117	336	568	782	1022
	330	27 1/2	54	119	342	578	796	1040
	336	28	55	121	348	588	810	1058
	342	28 1/2	56	123	354	598	824	1076
	348	29	57	125	360	608	838	1094
	354	29 1/2	58	127	366	618	852	1112
	360	30	59	129	372	628	866	1130
	366	30 1/2	60	131	378	638	880	1148
	372	31	61	133	384	648	894	1166
	378	31 1/2	62	135	390	658	908	1184
	384	32	63	137	396	668	922	1202
	390	32 1/2	64	139	402	678	936	1220
	396	33	65	141	408	688	950	1238
	402	33 1/2	66	143	414	698	964	1256
	408	34	67	145	420	708	978	1274

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J. F. CROSETT, Secretary, Gold Mining Exchange, No. 628 Sacramento Street, San Francisco, Cal. GOLD MINES FOR SALE. On Pacific Coast. Correspondence solicited.

IMPORTANT. To be sold, the Mineral Property called "DIOS TE GUIE," producing Silver and Gold, situated in the Section of Yepachi, Municipality of Famoachic, in the District Guerrero, State of Chihuahua, Mexico, by the Rascon Hermanos Co., of Nuevo Leon, Rayon District, State of Chihuahua, Mexico. For information as to price and conditions of sale apply to RASCON HERMANOS.

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Under order of the United States Circuit Court for the District of South Carolina.

The valuable piece of property, being the works of the Phosphate Mining Co., Limited, generally called Bro'herhood's, situated about 1 1/2 miles from Port Royal, S. C., consisting of about 24 acres, more or less, having a river frontage on Battery Creek of 971 feet, with fine wharves, etc. Convenient for loading ocean steamers (have from this point carried down steamers loaded to 21 ft. 6 in.). The Port Royal & Augusta Railroad passes through the property and has suitable switch conveniently located.

On property is fine large open shed some 240 feet by 70 feet, brick piers, with three railroad tracks overhead. Other desirable warehouse buildings, with overhead railroad trestles from wharves, boiler-house, etc.; desirable dwelling-houses and outhouses; fine artesian well and large brick cisterns.

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Moine & Neil's Code Used.

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MINER, GEOLOGIST, BUSINESS MAN, See page 7.

DIVIDENDS.

ISABELLA GOLD MINING COMPANY. COLORADO SPRINGS, Colo., September 10th, 1896. DIVIDEND NO. 9.

A dividend of ONE CENT PER SHARE (\$22,500) has been declared, payable September 25th, 1896, to stock holders of record September 18th, 1896.

The stock transfer books will be closed September 18th, 1896, at 3 o'clock p. m., and will be re-opened on the morning of September 25th, 1896.

PERCY HAGERMAN, Vice-President and Treasurer.

ONTARIO SILVER MINING COMPANY, MILLS BUILDING, 15 Broad Street, New York, Nov. 18, 1896. DIVIDEND NO. 208.

A dividend of TEN (10) CENTS PER SHARE has been declared, payable at the office of the company, San Francisco, or at the transfer agency in New York, on the 30th inst.

Transfer books close on the 25th. LOUNSBERY & CO., Transfer Agents.

QUINCY MINING COMPANY. NOVEMBER 9TH, 1896. DIVIDEND NO. 56 X.

An extra dividend of SIX DOLLARS (\$6) PER SHARE will be payable December 8th, next, to registered holders 16th inst. Stockholders residing in Massachusetts will be paid at the office of Mr. N. H. Daniels, Transfer Agent, 35 Congress street, Boston. W. M. R. TODD, Treasurer.

NOTICE OF ASSESSMENT.

(Civil Code of California.)

SILVER KING MINING COMPANY.—Location of principal place of business, San Francisco, Cal. Location of Works, Pioneer Mining District, Pinal County Arizona Territory.

Notice is hereby given that at a meeting of the Board of Directors, held on the 26th day of October, 1896, an assessment, No. 15, of 25 cents per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, No. 310 Pine Street, Rooms 15 and 17, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 7th day of December, 1896, shall be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on Tuesday the 5th day of January, 1896, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors. J. W. PEW, Secretary. Office, No. 310 Pine Street, Rooms 15 and 17, San Francisco, Cal.

ANDREW ROBERT HAMMOND, DECEASED.

Pursuant to the Statute 22d and 23d Victoria, Chapter 35, intituled "An Act to further Amend the Law of Property, and to relieve Trustees," notice is hereby given that all creditors and other persons having any debts, claims, or demands against the estate of Andrew Robert Hammond, late of Bulwogue, South Africa, but formerly of the City, County, and State of New York, in the United States of America, Mining Engineer, deceased, who died on the 29th day of March, 1896, and to whose Estate and Effects Letters of Administration were granted to Frederick Catesby Holland of 20 Bishopsgate Street, in the City of London, Esquire, the lawful attorney of Katharine Ruth Hammond, the lawful widow and relict of the said deceased, by the Principal Registry of the Probate Division of Her Majesty's High Court of Justice, on the 1st day of October, 1896, are hereby required to send particulars in writing of their debts, claims, or demands to us, the undersigned, as solicitors to the said administrator, on or before the 10th day of April, 1897. And notice is hereby given that at the expiration of that time the said administrator will proceed to distribute the assets of the said deceased among the parties entitled thereto, having regard only to the debts, claims, and demands of which he shall then have notice, and that he will not be liable for the assets or any part thereof so distributed to any person or persons of whose debt, claim, or demand he shall not then have had notice.

Dated this 19th day of October, 1896. PALMER, ELAND & NETTLESHIP, 4 Trafalgar Square, London, W. C., Solicitors to the said Administrator. Witness: STEPHEN R. J. ELAND.

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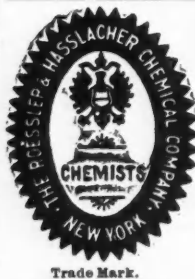
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