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An eight-page supplement, containing an installment of Howe's "Metallurgy of Steel," accompanies this number of the ENGINEERING AND MINING JOURNAL.

AN interesting step forward in the important undertaking of the Nicaragua Canal is marked by the departure of Mr. MENOCAL, the Engineer-in-Chief, on Thursday last for Greytown to resume charge in person of the works now in progress. The news brought by telegraph of the settlement, through the good offices of our Minister at Managua, of all difficulties between Nicaragua and its neighbor, Costa Rica, on the subject of the two concessions granted to the canal company, is a happy coincidence with Mr. MENOCAL's departure, and an assurance that the work will now go on steadily, and without interruption from local jealousy.

THE appointment by the Trustees of Columbia College of Mr. SETH LOW ex-Mayor of Brooklyn, as president of that institution is, in our opinion, a good one. In the discussion that has now gone on for more than a year as to the most suitable successor to President Barnard, the fact that Columbia College has now attained such growth that the first essential qualification necessary for its working is that he be a man of business, of large grasp and executive ability, seems to have been generally overlooked. Other men have been suggested to fill the president's chair who, no doubt, have higher attainments as scholars, but we think the trustees have exercised a wise discrimination in keeping in view that it is not a perfect professor that is needed, but an able, administrative head. Mr. Low is a thorough scholar, and is therefore fully aware of the requirements of the college in that respect, and will, no doubt, see that the standard of efficiency, which is now satisfactory, will be not only maintained, but further improved. The new president has proved himself to be a good and wise administrator, and that he should be an alumnus of the college, and have had the experience of eight years as trustee, is an additional advantage. Columbia College, we feel assured, will not decline during President Low's administration.

IN our last issue we gave an account of the greatest silver-lead mine in the world, the Broken Hill Proprietary of the Barrier Range, New South Wales. It is now announced that a new silver-lead discovery in the same district perhaps equals in extent this great mine. The following particulars of a mine in Queensland, Australia, the Mount Morgan, the greatest gold mine in the world, will also be of interest. The balance sheet for the half year just ended shows that the receipts for the six months were \$3,738,675, including about \$75,000 carried forward from the previous half-year's operations. Out of this \$2,875,000 have been distributed in dividends and about the same amount has been carried forward as was brought into the account. The dividends declared for the first nine months of the present year amount on an average to \$500,000 a month, or \$4,500,000. The average production of gold is over 1,000 ounces per day,

and it is stated that the amount of ore in sight would warrant even a larger plant than is in use. The ore is refractory and has given considerable trouble in attaining a satisfactory extraction, but as its average value is over four ounces to the ton, there is a good margin to work on. The ore is treated by chlorination in barrels, using the Newberry-Vaufin plant, to which process the ore is admirably suited. One impression that we gather from these accounts as from those of the Broken Hill mine is that the properties are not only ably but honestly administered and in this respect are an example to many undertakings in other countries.

WE are glad to learn that the rumors recently current as to the financial straits of the Johns Hopkins University are unfounded. In the report just issued by President GILMAN, it is admitted that the continued suspension of dividends (on Baltimore & Ohio Railway shares) gave much solicitude, but that a series of appropriate remedies have averted the threatened danger. There have been received contributions to the University's funds to the amount of \$108,700, the fees for tuition have been increased to a sum more nearly commensurate with that paid in kindred institutions; and the accumulations of former years have been considerable. These resources, with the addition of the bequest of the late JOHN W. MCCOY, to the value of about \$100,000, make the future of the University quite secure, and insure that its usefulness shall not be impaired. In the concluding sentence of his report, President GILMAN announces that he is going to take advantage of the leave of absence granted him by the trustees, and that after fourteen years of faithful service he is going to enjoy, for the first time during an academic session, a prolonged holiday.

The Johns Hopkins University is one of the glories of our country. It has done, and is doing, excellent work, and we rejoice in its success and congratulate those who have brought it about. It is not many years since, in these pages, we pointed out the dangerous and, as we thought, the inevitable result of having the University's endowment invested in Baltimore & Ohio Railroad Company's stock, and we regret that our conviction and prediction have come to pass.

## THE INTERNATIONAL MARINE CONFERENCE.

These are the days of conferences, conventions and congresses, and next week the International Marine Conference will meet in Washington. The representatives of about twenty-five nations from Europe, America and Asia will assemble, together with those representing this country, to discuss measures to secure greater safety to navigation. The faulty system now existing with regard to signals at sea leaves great room for improvement, and it is impossible that the deliberations of the conference should not result in good. The terms on which the acceptance of the invitation to discuss the subjects to be presented are such that the conclusions arrived at will not be final or binding, but only of an advisory or recommendatory character, but there can be but little doubt that such recommendations will be followed up by legislative or treaty action between the powers interested. One object sought to be attained is the fixing of an international load line, a provision inserted at the request of England, which country is at present the only one that has this protection for the lives of sailors. The sense and humanity of this regulation is so clear that it should meet with little opposition, and if nothing else were accomplished by the conference, it would be a step forward in the path of civilization. What will no doubt occupy much of the attention of the delegates and evoke very varied opinions, will be the consideration of the best methods of signaling and making known the position and course of vessels at night and in a fog. The Navy Department has been gathering valuable evidence and data on this subject, the result of experiments expressly undertaken for the purpose. It is admitted that the present system of signaling by single lights is very defective and often misleading as to the direction of the vessel, and this, it is reported by Commander Chadwick in charge of the trials, can be improved on by using two lights in a certain line and at a certain angle. If this is so, and the subject will be thoroughly discussed by competent experts, as England, Germany, France and the other leading maritime powers have delegated both naval and mercantile marine representatives of great experience, there should result valuable reforms in this direction. We may add that there is not a topic to be brought under consideration which is not capable of being dealt with in a way to the common good, and we should hope with a fair prospect of being so dealt with, thus making this conference in every way a contrast to the Congress of the Americas.

## CRANK SUGGESTIONS FOR THE WORLD'S FAIR.

A number of well-meaning people have volunteered suggestions for popularizing the proposed World's Fair, on the supposition that some striking or startling feature is needed to attract visitors and exhibitors. They have rushed into print with the desire to help the good cause along, and to advertise themselves. Some of these advisers venture upon the

domain of engineering, but they occasionally wander over the line and land in the realm of the ridiculous. The daily papers have contained accounts of an indefinite number of such volunteer schemes; a part offered by public-spirited amateurs, a part by cranks, and a part by persons who have their little axes to grind. A good deal of ingenuity has certainly been developed. But here is a rank and "chesnutty" plagiarism:

One man proposes building the highest tower on earth—Babel and the Eiffel production not excepted—making it 1,500 feet high, and selecting as a site a hill on Staten Island 300 feet above sea level, or 1,800 feet in all. At the top he would place a powerful electric light, which he says would be visible 150 miles out at sea. He only mistakes the range of such a light by about 98 miles, if one measures from the apex of the tower to the level of the water. At a distance of 52 miles his light would be just visible on the horizon, or, if seen from the deck, would appear a little above it. But if he positively insists on "letting his light so shine" as to be visible at 150 miles' distance, he will have his tower about right if he makes it 15,000 feet high, or 2.8 miles up in the air—in which case he can treat the opposition Eiffel concern with silent contempt.

Another genius tackles mining engineering and physical geology instead of architecture. This one prefers what is described as an "underground tower." He recommends "that shafts be sunk to a depth of 1,000 feet or more, of sufficient diameter to accommodate several elevators [cages?], and that the hot air which the engineers will strike after a certain depth be conveyed in pipes to the surface to warm the buildings." And the newspaper to which the communication was made, in explaining the scheme to its readers, gravely adds: "In short, the plan is to go deeper into the earth than anybody has ever gone before to collect scientific data of interest as to the conditions at different depths, and to give thousands the chance to enjoy the sensations produced by subterranean travel and exploring."

Crank No. 1 should go to school; crank No. 2 should go West and take that editor with him.

#### THE TRIAL OF THE PYX.

There is an old custom in England called "the trial of the Pyx," which dates back for certain more than 600 years, though many of our readers may not have heard of it, for the exact meaning or procedure of which is little known. The trial is an annual test of the accuracy in weight and fineness of the coins issued by the mint for the previous year, and is conducted by a jury composed of eleven members of the Goldsmiths' Company, of London. The jury selected is competent for the work assigned to it, and on the last occasion included the assayer of the Bank of England. The duties are carried out by the command under warrant of the Lords Commissioners of Her Majesty's Treasury, and the oath is administered by the Queen's Remembrancer, and until recently the labors of the jury were presided over by the Lord Chancellor, and in former times by the sovereign in person.

The origin of the term is the box in which, after each day's work, at the mint, one coin out of every 15 pounds troy weight in gold and one coin out of every 60 pounds troy weight in silver is deposited, Pyx being the anglicized form of the Greek word signifying box.

The first duty of the jury is to count all the coins thus set aside by the officers of the mint to ascertain if they correspond to the weight of bullion coined during the year. The next duty is to ascertain if the coins are of legal weight (a certain number being selected for testing), and the margin allowed by law is a very narrow one: in the case of sovereigns the standard weight in grains is 123.27447, and the remedy allowance 0.20000, for crowns 436.36363 grains, remedy allowance 1.81818, and in proportion for half-crowns, shillings, etc.

After this comes the testing by assay for fineness, and the coins and bullion, resulting from melting them together, have to be tested both by fire and by wet assay. The standard fineness of gold coins is .91666, against our standard of .900 fine, and on the recent trial of the Pyx the coins came out .91680, .91686, .91676 and .91670. The standard fineness of silver is .925, against our standard for coins of .900, and the average result was .9252.

When this custom was instituted, and for centuries later, it was no doubt a most salutary check upon every attempt to debase the current coin of the realm, but in these days of international exchange, when a banking house by a stroke of the pen can withdraw a large amount of coin from one country and transfer it to another, where its only value is as bullion, it is scarcely necessary, as any tampering with the standard would be immediately detected, and reported more promptly than by an annual jury test. At the same time it must be admitted that British gold is always accepted the world over as being what it is represented to be, and the check of the Pyx certainly justifies the common belief.

In connection with this subject the report of the Deputy Master of the Royal Mint, Mr. Fremantle (the Chancellor of the Exchequer is, we believe, the titular Master), should bring some comfort to silver-mine owners, as he states that up to the early part of this year over \$4,300,000

of the new design of silver coinage had been issued to the public; yet it is rarely met with in circulation, so that evidently there has been created a new market for silver.

#### THE WANING PROBABILITIES OF FINDING PAYING TIN MINES IN DAKOTA.

The promoters of the malodorous Harney Peak Tin-mining Company are pushing their schemes into print again, and evidently a stock boom is being worked up. This seems to have been started in London by securing the pages of the London edition of the *New York Herald*, and not only the *Herald* and the *Sun*, but other lesser luminaries here, have commenced to devote much, more or less valuable, space to "booming" the scheme.

The company which, with English capital, bought the numerous Harney Peak "prospects" at the prices of bonanza mines has done some exploration, and has sunk a number of shafts to very moderate depths. The best showing yet made, as we are informed by reliable experts who have recently visited the district, is in a mine where a vein varying from 18 inches to 48 inches of ore, estimated to run 2 per cent. of tin stone, is opened in the shaft, which was, at the date of examination, less than 90 feet deep. This, of course, is not a paying deposit, and from the information in our possession it would seem, much to our regret, that not a single paying deposit of tin has yet been opened in any part of Dakota.

After years of prospecting all over the Territory, and after some shaft sinking and underground development, the result has not yet justified the high expectations we and others had held of the probability of finding a paying deposit of tin; in fact, the failure to do so after so many years of work has greatly lessened the chances of such a deposit ever being found. We confess the results thus far are exceedingly disappointing to us as well as discouraging to investors, but they cannot be denied, and the present efforts to make a stock boom seem to us to be an indication that even the sanguine insiders are giving up hope.

It is said, on very good authority, that the entire tin output of Dakota for two years was recently made into a tin gavel, weighing about two pounds, and was presented to the chairman of the late Republican State Convention as coming "from the future base of the world's tin supply near Rapid City, Dakota."

All the good tin stone available was sent to London to help the deal, and probably a fresh lot of specimens will now be collected and sent to France to help the new scheme which we understand Mr. James Wilson is getting ready for the Paris market. The Dakota School of Mines is to be used, through Professor Bailey, to give the scheme a better appearance with the credulous Frenchmen. From what we consider entirely reliable information, we believe the whole scheme is worthless, a mere "bubble," which has no real value behind it; but Wilson and his associates make money whenever any one buys, and they have secured the assistance of nearly every one, from ministers down, in the so-called "tin districts" to help "boom" the bubble.

The English investors who disregarded our advice will have an opportunity to regret their course. We now warn others, whether English, French, or Americans, who may be disposed to invest in these schemes, to investigate the properties through disinterested and responsible experts before parting with their money. In New York they can learn many facts, and if they look and judge for themselves when in Dakota, they can easily ascertain the baselessness of the "boom" reports which are now being circulated.

#### NEW PUBLICATIONS.

A TREATISE ON MASONRY CONSTRUCTION. By Ira C. Baker, C. E., Professor of Civil Engineering, University of Illinois. Published by John Wiley & Sons, New York, 1889. Cloth, 8vo, xv. + 552 pp., including table of contents and index. Illustrated with plates and diagrams. Price, \$5.

This volume, Professor Baker explains, is an outgrowth of the needs of the author's own class-room. As a text-book it certainly is a most valuable addition to the literature of the subject, and is as complete and detailed as could well be looked for in a single volume. Of course, for reference in actual practice it would be necessary to supplement it by the many treatises on specialties which are available; but for the general use of engineering students the plan and scope are all that could be desired. The subject is so vast, and there are so many branches involved, that the author has found it impossible to go into great detail in any particular direction. He has, however, succeeded in keeping a very even balance between theory and practice, and has developed the art from elementary principles and descriptions to about the highest point practicable for classes in civil engineering. As just stated, the student who decides upon devoting his attention to a specialty, as for example the construction of masonry arches, will need to go somewhat deeper, and will naturally turn to less general treatises to complete his course of study; but he will obtain here a broad foundation on which to begin.

Professor Baker has covered a great deal of ground in these five hundred odd closely printed pages; has omitted little of the necessary elementary ground work, and has avoided repetition and the insertion of irrelevant matter. The arrangement is very systematic and the style of treatment is clear and direct. Most of the diagrams are given with dimensions, which add much to their utility.

The topics discussed are taken up in the following order: (1) Materials, including natural stone, brick, lime and cement; (2) preparing and using



the materials, under which head are described mortar, concrete, artificial stone, quarrying, stone cutting, stone masonry and brick masonry; (3) ordinary, pile and under-water foundations; (4) masonry structures, including dams, retaining walls, bridge abutments, piers, culverts and arches. The descriptions of actual structures are particularly interesting, and give point to the theoretical discussion.

The author has treated the subject from the standpoint of the civil engineer rather than that of the architect, but the work will prove useful to the latter also.

**SUBMARINE MINES AND TORPEDOES AS APPLIED TO HARBOR DEFENSE.** By JOHN TOWNSEND BUCKNILL, late Major Royal Engineers. Published by John Wiley & Sons, New York, and *Engineering*, London, 1889. Cloth, 8vo., 255 pp., including index. Illustrated. Price, \$4.

This work is in large part reprinted from a series of articles by Major Bucknill, which have appeared in London *Engineering*; but in putting them together in book form the author has made many revisions and additions. His experience with the British torpedo service, extending over many years and embracing "details" for experiment, observation and instruction, peculiarly fits Major Bucknill to speak with authority. While he is, of course, reticent as to the precise development of the British system of torpedo defense, and is limited in his descriptions to matters which are already made public by previously-printed descriptions, patent specifications, etc., the author criticises that system somewhat roundly in general terms, the chief objection being made on the score of intricacy.

The list of casualties inflicted by torpedos upon vessels during our civil war, as given in the first chapter, is a most striking proof of the efficiency of this means of harbor defense. The list covers 37 cases, most of the injury being done to the Union side, as is well known, the destruction of the Albemarle and some accidental losses being about all the damage suffered by the Confederates; but among these 37 examples are many more important ones than would be supposed by a reader who has not closely followed the history of the subject. From the experience gained during this war the author dates the inception of torpedo warfare as a scientific arm of attack and defense, the early experiments of Fulton and others at the beginning of the present century and the desultory efforts of the Russian engineers in the Crimean war having had little influence in advancing the art. But shortly after the close of our war, European governments began exhaustive experiments with stationary mines to determine their efficiency against vessels and to establish definite rules as to the danger-radius, effect of different explosives, crushing force per square inch, etc., required to destroy vessels of given types of construction and cellular subdivision. This study has, of course advanced very rapidly during recent years, since the introduction of automobile torpedoes. In this investigation the United States has taken a leading part, especially in the direction of fixed mines, and the author pays a well-merited compliment to the work of General Abbot.

The general arrangement of the book is as follows: (1) Theory; (2) experiment, and (3) practical application. A great variety of formulæ are given, and the illustrations of the various devices tried and in actual use are copious. Considerable space is given to description of the author's own inventions and to electrical matters. At the close of the book elaborate discussions of proposed systems of harbor defense are given, which detail the relationship between the contact and "observation" mines and the heavy artillery, quick-firing guns, patrol steamers, booms, electric search lights, torpedo boats, and all the auxiliary items which go to make up a complete system. It is evident that Major Bucknill is very sanguine as to the success of harbor defense by torpedoes when properly backed by the necessary adjunct arms.

#### WASHITA AND ARKANSAS OIL STONES AND QUARRIES.

Written for the *Engineering and Mining Journal* by J. J. Satt n.

Washita oil-stone rock is crystallized silica. The crystals are very small, and are formed in clusters with the point ends interlaced, leaving numerous cavities. These minute crystals are hexagonal in shape with sharp points, and can be seen under a microscope when magnified about 100 times. They are harder than steel, and that is the reason why whetstones cut from this rock will wear away and sharpen steel tools. Washita whetstones are called oil stones because oil must be used to fill the cavities and float away the steel particles that are cut off the tools.

The peculiar geological formation from which these rocks are taken is not known to exist outside of the State of Arkansas, where it occurs in many of the mountains of Saline, Hot Springs, Garland and Montgomery counties. These strata are in a vertical position varying from nearly perpendicular to nearly horizontal, and have been considerably broken by upheaval or folding of the earth's crust.

There are many grades in the quality of this rock, from very hard and vitreous flint to the softest whetstone grit. Nearly all of it is very hard and vitreous or contains some impurity. One grade, of a dull white color, full of cracks, and having but little grit, called bastard stone, is plentiful throughout this formation, but it is not used for whetstones. Some of the Washita rock quarried is not uniform in its texture, but contains hard spots and soft streaks that make uneven grit in the whetstones. Sound blocks, composed of perfect crystals, uniform in hardness, and having sharp grit, are only found in a few quarters in Garland County, near the city of Hot Springs.

The different grades of Washita rock that are used for whetstones weigh from 125 to 165 pounds per cubic foot. The best grades for good oil stones weigh from 135 to 145 pounds per cubic foot. The hardness and weight, and the sharpness of the grit, in any Washita oil stone depends entirely upon the character of its crystallization; and no fine polish, or nice finish on the surface, no fancy name will change the grit. Nature made and arranged these crystals mysteriously, and man cannot change them. The oil-stone manufacturer only cuts the rock into whetstone shapes and sizes; nothing more. He cannot make the grit in whetstones better than it is in the rock, and he cannot make good oil stones of Washita rock that is impure or vitreous, or of unequal hardness.

The softest Washita rock contains many grains of sand among the crystals. This quality has sharp grit but slight cohesion, so that the crystals separate readily and the stones wear away too fast. Such whetstones contain many sand holes. The lightest-weight rock that has perfect and

uniform crystallizations without any grains of sand, is the best quality to sharpen all woodworkers' tools and it makes the most durable oil stones. The light-weight whetstones generally have the sharpest grit, because they are the most porous. In them the crystals are interlaced in such a manner as to leave many cavities, and each cavity presents a great number of crystal points. The hard and heavy rocks are not sufficiently porous, being too compact. In them, many of the crystals interpenetrate each other in a manner that leaves less cavities and fewer crystal points.

One grade of this rock is known as fine Washita. Its crystallization is very fine and this stone is used by engravers, cutlery and file makers and by machinists, but it is hard and not very good for carpenters. All red Washita stones contain some iron, which gives to them that color. The rock from the red Washita quarries is impure and more or less imperfect in its crystallization. Some red rocks are almost like sandstone and the whetstones soon wear smooth, while others contain hard spots or soft streaks which cause the whetstones to wear away unevenly.

The best Washita stones are white, but many of the white stones in the markets are not good whetstones. Some have hard spots and others are too hard and vitreous. Dealers and mechanics are deceived by the nice and smooth finish and good appearance of vitreous stones, as they do not have a sharp grit and after a few months' use the pores get clogged and the stone is then smooth and worthless. The crystal dust on the surface of the new hard stones helps to make grit in their first use and that deceives the mechanics.

The rock of every good Washita quarry has its own peculiar form or manner of crystallization, slightly differing from that of other good quarries. The oil-stone manufacturers, who buy good rock and sell good Washita stones, have learned by experience that the rock from only a few certain quarries is the best for sharp-cutting and durable oil stones. Ten and twenty years ago they all bought only the best grades of this rock. There was no sale for the inferior grades, and the dealers were not then troubled with poor Washita stones.

But during several recent years there has been a great change in the oil-stone business. Active competition between the manufacturers has caused lower prices, and induced many sales of almost worthless stones. Considerable good Washita stone has been sold every year, but large quantities of defective and hard rock were bought from old quarries that were condemned and abandoned during many years, and many sales of smooth-finished vitreous and defective Washita stones were made to the jobbers and exporters at low prices, and these stones have been widely distributed over this country, and over some foreign countries, causing great trouble to dealers and mechanics. In proof of this, the carpenters in many places in all parts of our country complain of the smooth and uneven grit oil stones they buy, and they say the dealers do not have as good Washita stones now as were sold ten and more years ago. Mechanics all want good whetstones, and there is no demand by them for the inferior grades of Washita stones. Mechanics who work in wood buy most of the whetstones that are sold, and very few of them can tell the quality of any stones by the appearance. They generally suppose the smoothest-finished Washita stones are the best and sharpest grit, which opinion is not correct, as is above explained.

Geologists teach us that crystals grow, and that the Washita rocks were once beds of fine sand; and the grains of sand became crystals by some chemical action closely related to the Hot Springs waters. In the rocks that are now heavy and vitreous the crystals first formed into clusters and interlaced until they were crowded for room, when they interpenetrated each other and filled most of the original cavities. So some rocks that thousands of years ago were light and porous are now hard and heavy and almost solid like glass. Others now light and porous have changed less, and have perfect crystals and many cavities, and they are the best whetstone grit in the world.

The best Washita oil stones for carpenters weigh about 1½ to 1⅝ ounces per cubic inch. A stone that is 1 × 2 × 8 inches measures 16 cubic inches, and it should weigh about 1 pound 4 ounces to 1 pound 5 ounces. One that is 1½ × 2 × 8 (which is the standard size) measures 18 cubic inches, and it should weigh about 1 pound 6½ ounces to 1 pound 7½ ounces.

Arkansas oil stones have the same manner of crystallization as the Washita, but the crystals and cavities are smaller and more abundant. They do not have so sharp grit, but they make a very keen and smooth edge on a razor or a surgeon's knife. They both cut and polish, and are mostly used by watchmakers and dentists.

HOT SPRINGS, ARK., September 20th, 1889.

**Native Zinc.**—In the laboratory of the State Mining Bureau in San Francisco a discovery was made recently which is highly prized. In working a specimen of sulphide or blende ore sent from a mine in Shasta County, Cal., a small piece of native metallic zinc was secured. This is the first piece of the character named ever known to have been secured in this country. Late works on metallurgy note the existence in the mines of Victoria, Australia, of the only native metallic zinc known. The Mining Bureau will endeavor to secure other specimens from Shasta County.

**New Insulating Material.**—A recent German patent for a new insulating material for electric conductors specifies the use of paper which has been thoroughly soaked in an ammoniacal copper solution. The pasty mass is then pressed against the conducting wires to be covered by means of rollers, and the whole is finally submitted to strong pressure. When dry the covered wire is passed through a bath of boiling linseed oil, being left in it until the covering is saturated. This makes it elastic and impermeable to moisture. The covering is said to be durable and efficient as a non-conductor.

**Solidification of Nitrous Acid.**—Fl. Birhans.—To solidify anhydrous nitrous acid, though still containing small quantities of hyponitric acid, there is required a temperature of -52 degrees to -54 degrees C., obtained by the evaporation of methyl chloride in a current of dry air. To obtain anhydrous nitrous acid free from hyponitric acid, the author has operated similarly to Fritsche, but at a lower temperature. It forms a fine blue liquid, which was solidified only by the cold produced by a mixture of methyl chloride and carbonic acid in the flocculent state. This mixture, according to the experiments of MM. Cailliet and Colardeau, lowers the temperature to -82 degrees.—*Comptes Rendues*.





Waterford bridges are made from sketches taken from the existing structures. Burr also built another bridge over the Hudson at Fort Miller.

A bridge over the Connecticut River at Springfield was built about this same date by Mr. Walcott.

From 1804-06, Theodore Burr built the bridge over the Delaware River at Trenton (Plate VII.), consisting of five arch spans, two of 203 feet, one of 198 feet, one of 186 feet and one of 161 feet in the clear. Each span had five arched ribs, formed of white pine plank, from 35 to 50 feet in length and 4 inches thick, repeated one over the other, breaking joints, until they formed a depth of 32 inches. The lower chord was composed of two sticks  $6\frac{1}{2} \times 13\frac{1}{2}$  inches. The roadway was suspended from the arch ribs by vertical chains. The arch was counterbraced by diagonal braces, formed of two sticks  $6 \times 10$  inches spiked to the lower chord, and secured to the arch above by iron straps. Outside of the exterior ribs, wing arches 50 feet long splayed out so as to widen the bearing on the piers and abutments. The bridge had no other wind bracing. This bridge is erroneously credited to Lewis Wernwag. The arch footings required renewal in 1832, owing to decay of the timber. In 1848 the bridge was remodeled by removing the wing arches, and adding a new and stronger arch rib on the south side, and at the same time strengthening the adjacent old arch rib, by in-

IMPRESSIONS AND REMINISCENCES OF THE ENGINEERS' EUROPEAN TRIP.—V.

By One of Them.

(Concluded from page 246.)

*Sundry Trips in and about London.*—As we had only one week to spend in London, and as there were enough places to visit from which invitations were received to occupy three weeks at least, the printed programme for the week's work tried to solve the difficulty by providing alternate excursions for each day, from which we could make our choice. The general result was that whenever two members who had taken different excursions met in the evening, each would say at the same instant with "one breath," as we say, "Oh! but you missed it. You ought to have been with us. It was the finest," etc. On Friday we had three alternate trips offered to us. The first was a visit to the East and West India and Royal Victoria and Albert Docks, Beckton Gas Works, "with luncheon," and Metropolitan Main Drainage and Sewage Purification Works at Barking. The second was a visit to the foundations and pier of Tower bridge, Humphreys, Tennant & Co.'s marine engine works, Deptford Pier, luncheon at the "Ship," Greenwich, and finish with an inspection of Yarrow's

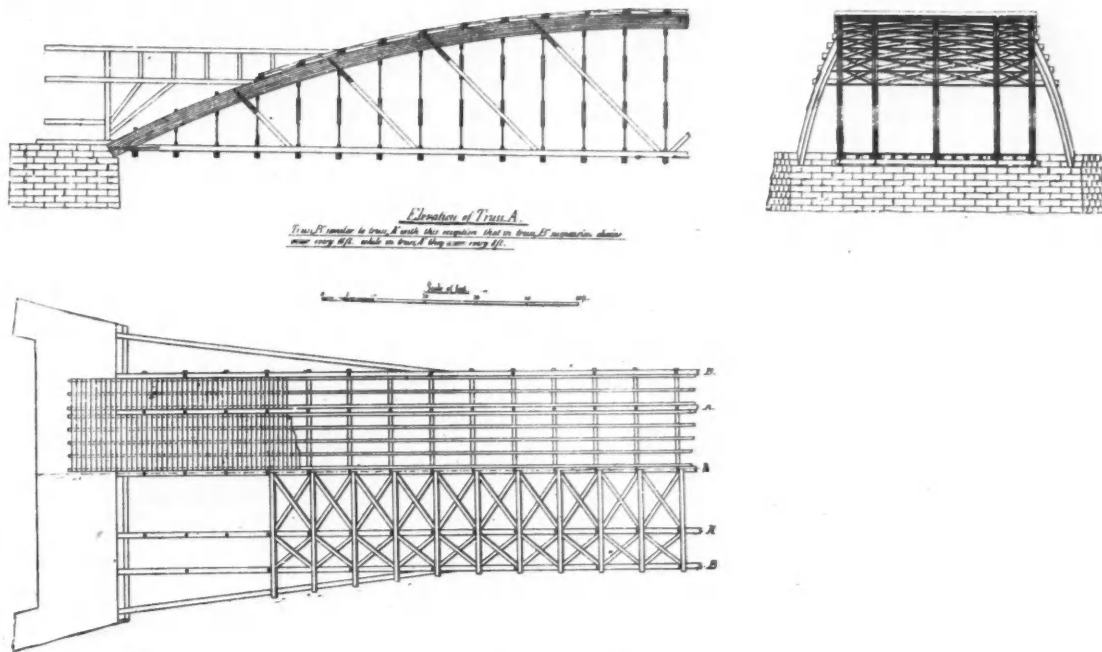


PLATE VII.



MOHAWK BRIDGE AT SCHENECTADY NY

Built by Theodore Burr

PLATE VIII.

creasing its depth to 4 feet, to carry a railroad track. In 1869 it was again strengthened. It was finally removed in 1875, and replaced by an iron structure.

This bridge may, therefore, be considered as a connecting link between the early wooden long-span bridges for highway traffic and those for railroad purposes.

In 1808, Theodore Burr built the bridge shown on Plate VIII., at Schenectady, N. Y. This was the second bridge built at that place by Burr, the first falling before or soon after completion. The traditions in regard to the first bridge are not very reliable. The contract for the one shown, however, states that it is to be "exactly on the site of the bridge built by the said Theodore at the same place," and apparently with different spans, as new piers are provided for by the contract. There may, therefore, be some truth in the tradition that the first bridge was to consist of two spans of 450 feet; that one span was completed and the other partially, when it fell or was swept away by floods.

The bridge shown is a curiosity in bridge construction. It is a suspension bridge of wood. The curved ribs are formed of eight  $4 \times 14$ -inch planks spiked or bolted together. The planks are cut to long bevells at the ends for splicing. The ribs are three in number, spaced about 13 feet apart. The timber was white pine. The plan shown is copied from Burr's original drawing attached to the contract.

The bridge was used for twenty years in this condition. It then became necessary to build additional piers under the middle of each span to stop the excessive sagging of the bridge. In this condition it stood till 1873, when it was replaced by an iron bridge.

From 1812-16 Theodore Burr built the bridge at Harrisburg, Pa., over the Susquehanna River, consisting of twelve spans of about 210 feet. The half of this bridge which is south of the Island still remains in use.

(TO BE CONTINUED.)

Shipbuilding and Torpedo Yard, Isle of Dogs, and a trip on one of Mr. Yarrow's torpedo boats. A numerous party went upon each of these two excursions, and were delighted with their experience. The third alternative, and the one which the writer availed himself of, was a visit to a number of works which were open to inspection, the list of which was as follows:

Messrs. J. & G. Rennie's Marine Engine Works, London Hydraulic Power Company's two stations, Mr. Peter Brotherhood's Engineering Works, Messrs. Maudslay Sons & Field's Marine and Mechanical Engineering Works, and Metropolitan Main Drainage Pumping Station. The third party did not visit these works in one body but went in detachments of one or two cab-loads each. This plan had its advantages and also its disadvantages. One of the latter was forcibly shown in the greeting the writer's party of five received at one of the establishments. On presenting our cards to the head of the establishment, he said, in a very gruff tone: "Why didn't the party come all at once? You are tiring me out showing one party after another around. But come along. I'll show you what we have." He immediately afterwards more than made up for the apparent want of cordiality of his reception by the freedom with which he showed and explained his most interesting and excellent works. The party of five had a great advantage over a crowd of visitors in the fine opportunity to see and inquire into details. At another of the works visited on this trip we were treated with the utmost cordiality, but here we could not, as at the first place, express so strongly our delight at the excellence of the plant, for it was of the most ancient type and the sentiments we felt were somewhat similar to those we had in Westminster Abbey. It was once a famous works, and we looked with reverence on the steam engine built by James Watt and the slotting machine of almost equal age, which seemed to be taking a rest at each return stroke, as if to get "good and ready" for the forward stroke. If we had visited

only this shop, and had been given to broad generalizations from a single observation, we would say England is far behind the age in her machine-shop practice; but we had seen Horwich and Manchester, and the establishment where we had the gruff welcome, and therefore could say that this ancient works was merely a survival, from a past generation, and was by far from being a representative English works of the present day.

*The London Hydraulic Power Company.*—One of the most interesting places visited on this day was the central pumping station of the London Hydraulic Power Company, at Blackfriars. Here we had to admit that in one branch of engineering, at least, the English are ahead of us—the distribution of power to great distances by hydraulic pressure. I will not, however, take up your space in repeating what was fully described in your issue of November 3d, 1888.

*The Power Transmission of the Future.*—The visit to the hydraulic station in London and the visit to the compressed air station in Paris, made a week later, gave rise to some reflections on the engineering conundrum of the day: what is the best means of transmitting power to a distance in cities? Paris has pneumatic transmission, London has hydraulic, Boston has "superheated water," New York has steam, Pittsburg natural gas, some places have wire cables and others have electricity. Reversing the Scotchman's verdict on whisky, they are all bad, but some are worse than others. Wire cable transmission is limited to short distances, and involves a heavy cost of repairs. Hydraulic transmission is not well adapted to high speed rotating machinery, and in our climate frost might cause trouble. Compressed air requires expensive machinery at the central station, large diameter of piping, and involves an initial loss of energy equal to the heat of compression. All of these are objectionable, moreover, in that they transmit power only and not heat. Electricity is dangerous, and requires expensive machinery at the point of consumption or re-conversion of the current into mechanical power. Superheated water requires enormously strong and expensive boilers and piping. Steam suffers loss from condensation, and the street piping requires frequent repairs. Natural gas is limited to certain favored districts only, and there it has an uncomfortable habit of exploding. Artificial fuel gas has promised great things, but has not yet performed them to any great extent. So they all have disadvantages, and above all none of them have been tried long enough in competition with each other to drive the poorest of them to the wall, and insure the survival of the fittest. It may be that in a city like New York there is room for two or three or more of the different systems to exist side by side, just as illuminating gas, petroleum and electric light all exist together for lighting purposes. The owners of the compressed air patents are trying to get their system introduced in New York. The hydraulic power people ought to have as good a chance. We may yet have under Broadway and other streets for the purpose of transmitting power, light and heat, compressed air pipes, hydraulic pipes, fuel gas pipes, illuminating gas pipes, steam pipes, superheated water pipes, high tension electric wires, low tension ditto, and wire cables for the street cars. But if so, will the streets ever be in good condition for traffic; and where will be the room for sewers, water pipes, and conduits for telegraph and telephone wires? There is going to be lots of work for the engineers in New York City for the next ten or twenty years solving this tough problem, eliminating the bad methods of transmission and perfecting the good ones.

*Brotherhood's Engine Works.*—We found the mechanical engineering works of Mr. Peter Brotherhood, in Lambeth, a very interesting place. His most well-known specialty is the three-cylinder single acting engine, the cylinders being arranged radially around the shaft at angles of 120 degrees with each other. It is a wonderfully compact engine. We were shown one designed to drive an automobile torpedo, which was said to be capable of developing 25 horse power, and yet it weighed only about 45 pounds. The motive power was not steam, but compressed air of a pressure of 500 pounds per square inch, which is carried in reservoirs inside of the torpedo. We wonder why the Brotherhood engine has not been introduced in America. The American Westinghouse engine has been established on a good footing in England, and it is being copied by other makers. To preserve the international balance of trade the Brotherhood should be introduced here. Mr. Brotherhood's works are thoroughly modern, and are well equipped for turning out work on the interchangeable part system. He has quite a variety of work under way in addition to the three-cylinder single engine, among it being a triple compound engine of ordinary type for small powers.

*Lambeth Palace.*—In the afternoon that portion of our party which visited the engine works in London in the morning had an opportunity to visit Lambeth Palace, the official residence of the Archbishop of Canterbury. It is a palace indeed, quite good enough, we should think, for the royal family. We were most cordially received by his Grace the Archbishop, and shown over the building by him. Among the most interesting things to be seen are the portraits arranged in chronological order of his predecessors for several centuries. Many of their names are among the famous ones of English history.

*The Lambeth Potteries.*—It was but a short walk from the palace to the famous art studios and manufactory of Sir Henry Doulton & Co., renowned the world over as makers of Doulton ware. Seen from a distance the works might be taken for a palace, so imposing is the architecture, and so different from our preconceived notions of a pottery, and on entering them they are seen to be a palace indeed of art and industry. They represent on the grandest scale the triumph of modern industrial art. Here are taken the commonest of raw materials, clay and the mineral colors, and the overabundant human material, the youth of London, to the number of several hundred; they are placed in proper relations to each other, and the result is a vast production of objects which gratify the eye and the imagination, and are prized as treasures by all who purchase them, from the kings and queens, who give them the place of honor in their palaces, to the humble cottager, who decorates his mantel with them. It is all accomplished through a proper system of art education, which is given at the Lambeth School of Art and at the National Art Training School in South Kensington. It is all so recent, too. The Lambeth Art School was established in 1854 by Canon Gregory, who was desirous of affording his parishioners a means of gratifying their taste for drawing. It had a small beginning, for only one potter entered the school; but he formed the link by which the school and the potteries were brought together. The Doulton ware has been in existence only about twenty years.

In 1885 the Prince of Wales presented Mr. Henry Doulton with the Albert medal of the Society of Arts, which is awarded only to those who for distinguished merit in promoting art, manufactures and commerce are worthy of receiving it. The prince said on this occasion: "From all you have done, Mr. Doulton, for art, not only in this country, but throughout the world, I do not think there is any one more deserving of the high compliment we are about to pay you."

Surely there was no one of our party who did not think that this compliment was deserved. Surely there was none whose ideas of art and art education were not exalted by this visit. We have made a beginning in the direction of art education in America, as applied to pottery. We have the Rookwood pottery in Cincinnati, which exhibited some of its products at the Paris Exhibition. The establishing of this pottery was the work of one American lady. Let us hope that it will shortly become as famous as the Doulton pottery.

#### BIOGRAPHICAL NOTICE OF WILLIAM H. SCRANTON.

By R. W. Raymond, New York City.\*

In the death of William H. Scranton, which occurred at Oxford, N. J., June 19, 1889, the Institute has been called once more to mourn the loss of a name from the fast diminishing list of those who constituted its membership in the first year of its existence. But it loses more than a name—a friendly presence and an intellectual force have departed; a fruitful life has been cut short.

Mr. Scranton was born in Belvidere, N. J., on the 13th of January, 1840. He was the eldest son of Col. George W. Scranton, the founder of Scranton, Pa., and in the critical years of 1860 and 1861, the representative in Congress of the Scranton district. The family removed from Belvidere to Scranton in 1840, while William was an infant. After five years of schooling at Montrose and Wyoming, Pa., and Stamford, Conn., he entered the Rensselaer Polytechnic Institute in 1857. Leaving the institution about the end of 1860, he settled himself at Oxford, N. J., as civil and mining engineer for the firm of G. W. & S. T. Scranton, which became in 1863 the Oxford Iron Company. Of this company he continued the engineer up to 1873, constructing during this period the buildings, furnaces, etc., which still stand at Oxford. In 1873 he became general manager of this company, taking charge of its mines, works and business affairs, and the position he retained after the concern was reorganized as the Oxford Iron and Nail Company in 1878, and until he resigned his office in November, 1885. In January, 1886, he became general manager of the Fall River Iron Works in Massachusetts, and upon the discontinuance of that enterprise a year or two later, wound up its business and returned to his old home at Oxford, where he occupied himself with his practice as a consulting engineer, and with the pursuit of professional investigations and commercial undertakings on his own account. One of the latest of these was the introduction into the United States of the Wenström magnetic separator, recently described in the papers of Mr. Cook and Mr. Birkinbine, in Volume XVII. of the *Transactions* of this Institute. Both the merits of this machine and the field of its practical usefulness were directly connected with the favorite study of his life, to which I will presently recur.

The career of an engineer and general manager, remaining for twenty-two years at one place, must be largely one of routine, and its achievements are too often unappreciated for lack of an adequate record and a competent historian to interpret it and call attention to it. When a man thus engaged makes his own record in professional papers, his colleagues, and ultimately the public, come to know what he is doing, to recognize his ability and to applaud his success. But if he is too busy or too bashful to give to others this chance of becoming acquainted with him, he may receive far less praise than he deserves. Both these hindrances existed in the case of Mr. Scranton; and a third may be added, namely, the circumstance that he began his professional work at a time when there was in this country no such wide and accessible professional public and no such organized means of general intercommunication among its members as the rapid development of our technical journals and technical societies has furnished since. That he was quick to recognize the advantages of such intercourse, his prompt adhesion to this Institute, and the unflinching interest which he manifested in its proceedings, abundantly testify. But he could not so suddenly form the habit of a free utterance of his own experience and opinions, and by his unconquerable timidity and reticence he lost much, while his colleagues lost yet more. It is, therefore, with scanty materials, drawn partly from my own reminiscences, partly from the brief memoranda of personal friends, that I construct a tribute to his work and character less complete than they deserve.

Mr. Scranton was an accomplished draughtsman, designer and architect. The large blast furnace at Oxford, of which he made the plans and superintended the construction in 1872, and which he remodeled and improved in 1885, is a standing evidence of his skill. In its day it was a model of thorough and advanced scientific construction, and it has long had the reputation of producing excellent pig-iron at exceptionally low cost. As all furnacemen know, the cheapness of raw materials and the reduction of labor-cost in unnecessary handling are important elements of such a result; but this fact does not diminish the credit due to Mr. Scranton, for the mining and transportation, as well as the general metallurgical and mechanical direction, were under his charge and received the impress of his mind.

As a manager of workmen his success was extraordinary. Employing from 800 to 1,000 miners, furnacemen, mechanics and laborers of all classes, he commanded so entirely their confidence and respect that he never encountered a strike. Both capitalists and workmen recognized his strict justice and absolute integrity, as well as the kindness of his disposition; and men of all classes became and remained his friends.

He was a constant student of books, making copious notes of his reading, as well as his original experiments and investigations. His notebooks were models of fullness, order, and critical analysis. His house at

\* Ottawa meeting American Institute of Mining Engineers.

† An invaluable collection of these note-books, with drawings, calculations, etc., has disappeared since his death, through the dastardly outrage of the robbery of his private office by unknown parties.



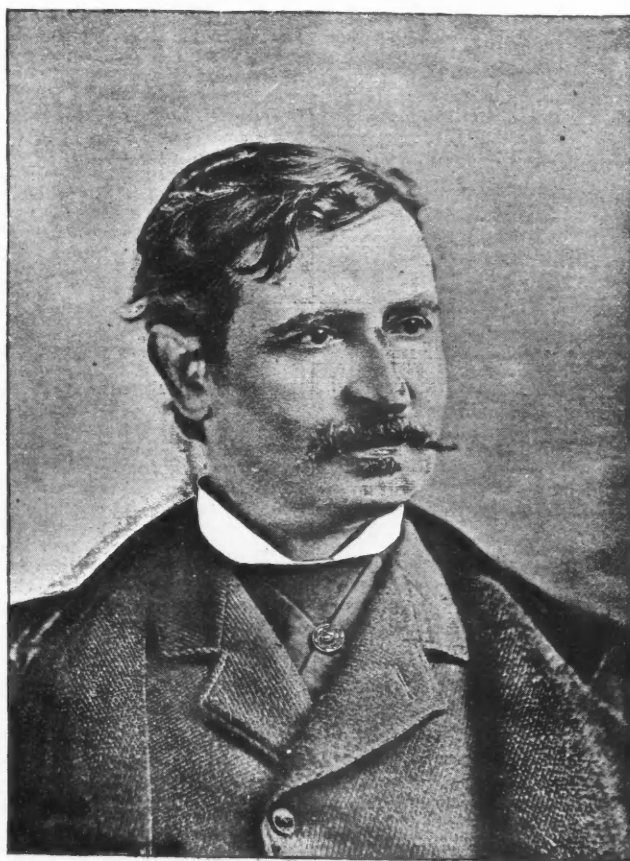
Oxford was the home of domestic happiness and refined and cordial hospitality; and those who enjoyed the privilege of tarrying beneath its roof found in their host a surprising range of knowledge, and a power of imparting it which his habitual reserve in public did not indicate.

The principal contribution which Mr. Scranton made to the practice of our profession (though, unfortunately, not in satisfactory measure to its literature) was connected with the use of the magnetic needle in the survey of iron-ore deposits. His interest in this subject began at a very early period. His mother's brother, Mr. James Hiles, of Belvidere, N. J., a land surveyor by profession, was a man of conscientious accuracy, original force and sympathetic temperament, highly esteemed as an authority on engineering matters by the people of that region. Doubtless the influence of this uncle, with whom young Scranton used to spend much of his time, and who delighted to encourage and guide the boy's ambition, had much to do with his choice of a profession. Mr. Scranton was accustomed to speak of his uncle with much admiration and affection, and to acknowledge his own indebtedness to this happy early companionship for inestimable training and inspiration. When Mr. Hiles died, about twenty years ago, his maps and papers were left to the nephew who had been his pupil.

Mr. Hiles had satisfied himself of the inaccurate and misleading character of the indications of the dip-needle as ordinarily used by miners, and had developed by himself a system of magnetic surveying, calculated to

of the delay in the public description of a method already used for years is curiously characteristic of Mr. Scranton. Early in his connections with the Institute as a member, he had determined to prepare a paper on the subject, both as a vindication of the memory and merit of his uncle, and as a useful contribution to an important department of mining practice. Once at least he had come to a meeting of the Institute with such a paper in his pocket, and had carried it home again unread, because he was too bashful, when the critical moment came, to get up and read it. Angry with himself for such timidity, and resolved to overcome it, at all cost, he made another effort, and once more (in February, 1876, I believe) brought the paper to a session of the Institute. Unfortunately, while he sat, fighting within himself for courage to face even that harmless audience, a fellow-member, Prof. J. C. Smock, of the New Jersey Geological Survey, presented a paper on the same subject. Professor Smock, in New Jersey, and Mr. T. B. Brooks, in Michigan, working on the same lines, had arrived at something like the system of Mr. Hiles. If Mr. Scranton had had a little less modesty or a little more experience in such matters, he would have known that the presentation of Professor Smock's paper rendered his own the more appropriate. But to his fancy, it took away his last chance of utterance, and once more he silently carried his manuscript home.

In later years he overcame, to some extent, this reluctance to speak his views. At least he contributed valuable papers and maps to the New



WILLIAM H. SCRANTON.

reduce the sources of error and to increase greatly the definiteness of interpretation. He had constructed several dip-needles of improved form, two of which (among the first, if not the very first, made in this country) are still preserved in the house at Oxford. The Scrantons being heavily interested in iron mines and iron-ore bearing lands, William Scranton was, from the beginning, called upon to make numerous surveys of such properties and devise plans for their development. This led him to perfect the system conceived by his uncle; and the maps of magnetic surveys which he constructed twenty-five years ago prove him to have been one of the first to develop the systematic determination and interpretation of magnetic intensities, as well as dips, for tracing the limits of underground deposits of magnetite. His practical skill in the use of his system was extraordinary, and it should be noted that his conclusions were over and over again submitted to the severe test of immediate trial in mining. His surveys were made the basis for the location of shafts, the running of drifts and levels, the purchase of land and the calculation of necessary ore-supplies. This test they stood so well as to give to him great confidence in the method, and to others great confidence in him. But he was always anxious that Mr. Hiles, as the real originator of the system, should receive the credit for it.

Dr. George H. Cook, the State Geologist of New Jersey—another honored member of the Institute, whose still more recent death we mourn—recognized the ability and authority of Mr. Scranton in this field, and the report of the State Survey for 1879 contains a chapter in which the system of Scranton is outlined, though not fully set forth. The reason

Jersey reports. In 1888, and down to the time of his death, I believe, he was regularly connected with the State Survey. Dr. Cook imported from Sweden a modern magnetometer, the product of the latest improvements made by Swedish skill in the art of magnetic surveying. Mr. Scranton recognized at once its superiority to the dip-needle, and, in association with Mr. Uno Sebenus, a Swedish engineer sent over to expound the merits and show the application of the new instrument, he operated with it in field-work during the last year of his life, made improvements upon it, and incorporated it in the system which he had perfected.

Once more (and this time without risk of being frightened from his intention) he determined to present to the Institute the ripe results of his study and practice; and at the time of his death he had arranged the materials for a paper on the magnetic survey of iron mines, and had prepared portions of the paper, which was unfortunately among those stolen. This would have been probably the best comprehensive treatise on the subject, combining foreign with American progress, and adding much valuable criticism and suggestion.

Upon the monument of his father, in the family plot at Dunmore Cemetery, at Scranton, are engraved these words:

"Kind-hearted and benevolent, genial and true in his relations with his fellow-men; a man of noble purposes and high Christian character; he was called to his reward in the midst of his usefulness, loved and mourned by all who knew him."

The worthy son of such a father sleeps now beside him; and the same inscription may fitly stand for both.

## THE AMERICAN INSTITUTE OF MINING ENGINEERS—OTTAWA MEETING.

From our Special Correspondent.

(Concluded from page 288.)

The morning of the third day was devoted to visiting objects of interest about the city, especially the Museum of the Canadian Geological Survey. At the afternoon session Dr. Raymond proposed an amendment to the by-laws, authorizing the election of members by mail ballot.

A paper on the Geological Relations of the Nova Scotia Minerals, by E. Gilpin, of Halifax, was read by B. T. A. Bell. The extent of the mineral formations, as well as the number of the geological horizons, is limited in comparison with the United States.

The principal gold fields of Nova Scotia are on the Atlantic coast. In Cape Breton iron ore abounds, running from 20 to 40 per cent. Copper beds are found at Margareville, and near Pictou, the latter running as high as 40 per cent. Coal abounds both in Nova Scotia and Cape Breton, last year's production being 1,500,000 tons. Gypsum is the most prominent mineral of Nova Scotia. The extent of mineral lands is about 3,000 square miles. Near Sidney copper abounds mixed with gold and silver. The minerals are in the following order: coal, iron, gold, a combination not often found.

E. D. Ingalls, of Ottawa, read notes on the Port Arthur Silver District. The characteristic appearance of the landscape in this region is the flat-topped hills, a formation caused by the intrusion of trap between the beds of argillaceous schists. As a general rule, the richest deposits of silver are in the blackest and softest slates. The silver-bearing rocks are 12,000 feet thick. The silver occurs in fissures, and the people ought, he thinks, to feel encouraged to believe that whenever they get a vein on surface it will continue as far down as they choose to go. The gangue rock contains many interesting minerals, including quartz, amethysts of much beauty being often found. An interesting feature is the occurrence of mineralized water and associated inflammable gas, the most abundant ingredients being chloride of sodium and chloride of calcium. The accompanying minerals include galena and blende.

The most usual forms in which silver occurs are as sulphide and native silver, forming detached ore bodies. The veins generally run in several directions, of which the three prevalent ones are northeast and southwest, northwest and southeast, and nearly east and west.

The ore in the veins occurs in bunches, surrounded by barren ground. The greatest depth yet reached is 525 feet, at the Beaver mine. The greatest yield was that of the Silver Islet mine, from which \$3,250,000 was taken, and some of the present mines promise to be equally successful.

John E. Hardman, of Nova Scotia, gave an account of gold mining in Nova Scotia. The gold here is very pure, running as high as \$19.75 and in some cases over \$20 per ounce. The bane of Nova Scotia mining is the hand-to-mouth system of paying all the profits every Saturday night, leaving nothing to work the mine with when the inevitable lean streak is reached. The quartz is worth \$15 per ton, and the province is rich in valuable deposits, which will pay well when properly worked.

The total yield since the first mining, twenty-eight years ago, is over \$9,000,000. The actual area from which gold is found in workable quantities is not over 40 square miles.

The lack of profit in the Nova Scotia mines is not due to lack of gold there, but to lack of more meetings of the American Institute of Mining Engineers in Canada, and improved methods of working.

Mr. Leckie showed a number of fine specimens, which the members pronounced the finest they had ever seen. One lump of ore twice the size of a man's fist was valued at \$1,100. They were from the Montague gold mine, near Halifax. The vein runs from eight inches to two feet in width, and has been opened to a length of 600 feet. The deepest point reached is 160 feet.

Vice-President Egleston read a paper on the saving of fine gold in amalgamation. The gold is found in large quantities along the Snake River in Idaho. Similar districts were seen by Professor Egleston in Canada. The cañon through which the river runs is over 500 feet high. At the falls it is much deeper. The rock is porphyry, capped by basalt. The alkaline waters have leached out the rocks.

The gold is the result of solution and subsequent deposition. The débris is worked 50 miles below the falls. The greatest value of these sands has not exceeded ten cents per yard, but the five men working it easily make \$1,000 to \$1,500 a month by simple appliances, undermining the banks and carrying the sands into a sluice provided with iron plates pierced with conical holes,  $\frac{3}{8}$  to  $\frac{1}{2}$  inch in diameter. The sand bearing water passes over, and the sand is carried down and ultimately reaches and passes over a burlap, which entangles and detains it. The gold is very fine, and most of it floats on water. The men might easily make three or four times as much as they do.

Dr. Raymond said that Professor Egleston's idea of the origin of the gold was new to him, and he did not take very kindly to it.

Papers read by title were: Gold Quartz, by W. M. Curtis, of Detroit; Notes on Some Coals in Western Canada, by W. Hamilton Merritt; Stamp Mills, by John Hays Hammond; Ventilation, Progress, and Cost of the New Croton Aqueduct, by J. P. Carson; the Wear of Rails as Related to their Section, by P. H. Dudley; the Columbia Iron and Steel Works, Pittsburg, Pa., by G. W. Maynard; the Physical Properties of Aluminium, and a Comparison of it with Other Metals, by W. J. Keep; Phosphorus in Cast Iron, by W. J. Keep; Canada's Great Geologist (Sir William Logan), by Dr. Robert Bell; the Davis-Colby Roasting Kiln, by S. G. Valentine; Commercial Economy, by Dr. R. W. Raymond; a Reminiscence of Freiberg, by Thomas MacFarlane; Notes on the Republic of Columbia, S. A., by J. C. F. Randolph.

It was announced that, owing to the smallness of number of members who desired to go, the proposed excursion to Port Arthur had been abandoned.

At the evening session, Dr. E. D. Peters, Jr., read a paper on the mines and works of the Canadian Copper Company at Sudbury. These ore deposits possess a peculiar interest for a variety of reasons: In the first place, they are deep within the borders of the Huronian rocks, and are consequently among the oldest deposits that we know of, unless, indeed, the ores were deposited at a much later period than the country rock. Again, they carry nickel in unusual proportions, and lastly, they are

unique in containing a small amount of platinum, although arsenic is not present.

The rocks of this system are tilted to about 70 degrees, so that the whole country may be said to be standing on end.

A general feature is that the ore bodies are in close proximity to extensive dikes or tilted beds of diorite. The ore usually occurs at the point of contact between the diorite and graywacke.

He described the method of roasting ore. Wood is used simply to kindle the heap, and the contained sulphur keeps up the combustion. A large number of ore heaps are ignited side by side, and as soon as the fumes decrease sufficiently to permit men to work, the interstices between heaps are filled with fresh ore and ignited, a very successful method and one pronounced by the president and secretary of the Institute "entirely new." The peculiar feature of the smelting furnace is its front connecting reservoir: a circular cast-iron water-jacketed vessel so designed as to connect with the outlet hole of the furnace, and receive the molten slag and matte as rapidly as they are formed, thus obviating salamanders. The matte contains an average of 27 per cent. copper, and 15 to 18 per cent. nickel. It is shipped to Swansea to be refined. The world's production of nickel has been less than 1,000 tons, mostly from New Caledonia, which cannot afford to produce at present prices. The Sudbury mines yield 2,000 to 3,000 tons, and can easily yield 5,000 or 6,000.

An interesting discussion followed. Dr. Peters added that the success of the furnaces depended largely on two points: first, maintaining a strong blast; secondly, mixing the three kinds of ore before roasting, thus facilitating the union of atoms in the furnace. Dr. Bell said that Dr. Peters had attained success unexampled in the history of metallurgy in this country. Dr. Raymond seconded the encomium of Dr. Bell, and added that Dr. Peters is the author of our best work on the metallurgy of copper. He commented on the difficulty of explaining the genesis of copper and the paragenesis of nickel and pyrrhotite. He agreed with Peters that the secret of success in blast furnaces is to blow, and blow hard.

Dr. Robert Bell read a paper on the phosphate deposit of Ottawa County. These deposits occur in the Laurentian system, and the workable ores in the upper Laurentian, which is confined to a narrow strip about 150 miles wide, running from Lake Nipissing to the Lower St. Lawrence. The rock most intimately associated with phosphate is pyroxene. Several others were mentioned. One of the most common mineralogical concomitants is mica. Some have supposed the phosphate originated in animal life; but phosphates antedate organic life.

The phosphatic rock, being soft, dissolves away more rapidly than the harder associated rocks, hence the proportion of phosphatic rock is greater than surface indications would lead us to expect; and a result of this dissolving away of the soft rocks is to leave the surface of the ground hummocky. All the deposits are of the nature of mineral veins, and hence are newer than the containing rocks. The principal mines in Templeton, Portland and Wells townships were described and illustrated by diagrams showing the very great variety in the nature of the different deposits.

In discussing the paper, Captain Adams, noting the fact that the analyses made by buyers' chemists almost invariably showed a smaller proportion of phosphorus than those by sellers' chemists, said, "It has struck me as an astounding point in chemistry that molybdic acid should precipitate phosphorus in accordance with the interest of the buyer."

A paper on the Possibilities of Iron Manufacture at Ottawa, by John Birkinbine, was read by title.

Usual vote of thanks was passed.

The excursion on Friday was to the phosphate mines near Buckingham.

On Friday night some of the party took the midnight train for Sudbury, rejoining the others at Montreal on Sunday evening.

On Monday another excursion took place to the Eustis copper mine, in the Capelton District, and later the Westheim asbestos mine was visited.

## OFFICIAL REPORTS.

## THE HOMESTAKE MINING COMPANY.

The directors' report to the stockholders of the Homestake Mining Company consists simply in submitting the superintendent's brief but satisfactory report and the financial statement of the secretary for the fiscal year ending June 1st, 1889.

*Superintendent's Report.*—Yesterday another fiscal year for the "Homestake" closed. For an account of the receipts, disbursements, tons of ore milled, etc., during the period, see detailed statement of the secretary accompanying this.

There has been no shaft-sinking done since the last annual report was made, but the operations at the mine have rather been confined to spreading out in all directions at the different levels already opened up. The results of this work are gratifying, so far as the quantity of ore uncovered is concerned, and from present indications we are justified in confidently believing that the next year's product will show an increase over that of the past twelve months.

We have four years' ore in sight.

In the milling department, a trial was given a steam stamp, with a view of ascertaining if a reduction in expenses could be made therein with that kind of machinery, but as the results, compared to our large mills, were not satisfactory, either in point of economy of operation, or in saving the gold, it was shut down.

Everything about the property is in good condition and running smoothly.

Yours truly,

T. J. GRIER, Superintendent.

## FISCAL STATEMENT TO JUNE 1ST, 1889.

*Receipts.*—Balance on hand per report, June 1, 1888, \$118,509.76; black-smith shop, labor, \$4,425.25; saw mill, lumber, \$20,288.15; machine shop, labor, \$4,015.70; foundry, supplies, \$17,288.47; tailings, concentrating works, supplies, \$6; bullion, gross product bars 472 to 541, inclusive, \$970,744.33. Total, \$1,135,277.66.

*Disbursements.*—Mine: Labor, \$295,102.78, supplies, \$14,611.64, powder, \$40,554.95, candles, \$4,983.42, machinery, \$12,406.97, oil, \$2,392.30, timber, \$60,547.99, coal, 1,488.86; total mine, \$452,088.91; deadwork, \$54,941.50; Homestake Shaft: Machinery, \$783.42, Golden Star Shaft, \$9,336.27, B. &



M. Shaft, \$13,585.75; 80-Stamp Mill: Labor, \$25,572.45, supplies, \$492.34, water, \$16,685.66, wood, \$23,814, machinery, \$9,535.74, oil, \$894.09, candles, \$146.25, quicksilver, \$570, lumber, \$1,485.68; total 80-stamp mill, \$79,186.21; 120-stamp mill: labor, \$28,488.55, supplies, \$711.47, water, \$26,232.82, wood, \$31,699.71, machinery, \$17,605.47, oil, \$981.11, candles, \$229.00, quicksilver, \$1,330.00, lumber, \$1,417.45, total 150-stamp mill, \$108,695.58; saw mill, \$18,935.63; blacksmith shop, \$2,453.31; machine shop, \$2,959.45; foundry, \$14,686.81; steam stamp: labor, \$11,057.15, supplies, \$1,899.04, machinery, \$13,263.42, lumber, \$2,940.45, oil, \$273.10, candles, \$44, water, \$3,877.15, wood, \$5,496, total steam stamp, \$38,350.31; superintendent's residence, \$1,689.27; bullion: freight, mint charges, etc., \$10,581.18, tramway, \$11,566.75, assay office, \$902.41, survey, \$16.65, interest and discount, \$2,142.52, salaries, \$5,700, taxes, \$21,130.25; expense account: general, \$3,241.34, legal, \$2,990.98, total expense account, \$6,232.32; dividends, \$275,000, property purchase, \$1,256.45, hospital, \$2,434.16; balance: cash in hands treasurer, \$19,584.19, cash in hands superintendent, \$1,038.36, total balance, \$20,622.55; grand total, \$1,135,277.66.

The cause of the reduction of the Homestake dividend to ten cents a share in the early part of the year, which very perceptibly weakened the confidence of shareholders for a while, was a falling off in the grade of the ore. The company's annual reports show that during the fiscal year ending June 1st, 1888, the average value of the ore was \$3.71 per ton, while during the year ending June 1st, 1889, the average value was only \$3.39½ per ton, a falling off which makes a serious reduction of the company's profits, milling as it did nearly 300,000 tons. This explains the necessity of reducing dividends even with an increase in production of over 40,000 tons for the year just ended over the preceding one.

During July, according to the figures kindly furnished us by Messrs. Lounsbury, the ore returned \$3.61 per ton, and during August, \$3.43. September's figures have not yet been received. We have, however, private advices that the mine never looked better, and that further increase in the number of stamps is more than possible.

THE QUICKSILVER MINING COMPANY.

The following is the report of Mr. J. B. Randol, manager of the Quicksilver Mining Company, of the company's operations at New Almaden, California:

I herewith submit my report on the operations of your company for the year ending 30th April, 1889: The receipts were \$716,010.22, as follows: From quicksilver sales, \$695,207.64; miscellaneous, \$20,802.58; and the expenditures were \$465,902.32; for pay-rolls, \$339,284.33; supplies, \$95,947.17; taxes and miscellaneous, \$28,311.72; litigation expenses, \$2,362.80; leaving a surplus of \$250,107.90. The cash on hand April 30th, 1888, was \$82,620.43, and on April 30th, 1889, \$71,321.08, a decrease of \$11,299.35, making a sum to be accounted for of \$261,407.25, which amount was remitted to the New York office.

The property account per my last report showed balances of \$348,727.30, to which add net earnings for year April 30th, 1888, to April 30th, 1889, \$131,623.68, and there is a total of \$480,350.98, which is accounted for as follows: By quicksilver, \$83,480; supplies, \$38,748.55; ore, \$23,031.30; cash, \$71,321.08; total, \$216,580.93. By litigation expenses, \$2,362.80; remittances to New York office, \$261,407.25; grand total, \$480,350.98.

The sales of quicksilver compare as follows with those of the previous year:

|          |   |
|----------|---|
| 1887-'88 | 20,501 flasks, \$785,880.06, averaging \$38.33 <sup>4</sup> |
| 1888-'89 | 18,082 " 695,207.64, " 38.44 <sup>8</sup>                   |

Showing a decrease of 2,419 flasks sold, a decrease of \$90,672.42 in returns, and the slight increase of 11½ cents per flask on the average result of sales.

The expenditures for litigation were on account of counsel fees and costs in the suit of Jane M. Gray *et al.* vs. The Quicksilver Mining Company, in which suit further testimony is yet to be taken.

Your properties were maintained in good condition, and all improvements and repairs were charged to current expenses.

The earnings and expenses of your mines were respectively \$623,090.72 and \$491,467.04, leaving to profit and loss a balance of \$131,623.68.

These earnings and expenses were made up as follows:

|  |              |
|--|--------------|
| EARNINGS.  |              |
| From 15,200 flasks of quicksilver produced, average value \$39.62 <sup>4</sup> ..... | \$602,288.14 |
| From rents and miscellaneous.....  | 20,802.58    |
| Total earnings.....  | \$623,090.72 |
| EXPENSES.  |              |
| Mine pay rolls.....  | \$339,284.33 |
| Hacienda pay rolls.....  | 54,620.06    |
| Taxes and miscellaneous.....   | 28,311.72    |
| Supplies consumed.....   | 104,037.74   |
|  | \$471,633.79 |
| Surplus.....   | \$151,456.93 |
| Ore account decreased.....   | 19,833.25    |
| Net earnings.....  | \$131,623.68 |

Compared with the preceding fiscal year these results show a decreased production of 5,300 flasks, an increased average value of 1.77½ cents; an increase in rents and miscellaneous of \$1,666.63, with a total decreased earnings of \$171,949.79. The mine pay rolls decreased \$12,942.89; Hacienda pay-rolls increased \$629.20; taxes and miscellaneous increase \$33.83, and supplies decreased \$12,362.42. The net decreased in these items was \$24,662.28, and the surplus of earnings over expenses was \$151,456.93, a decrease of \$147,287.51.

The ore account in my last report showed an increase of \$29,983.74, but for the period under review there was a decrease in that account of \$19,833.25, which being deducted from the surplus earnings leaves a net credit to profit and loss of \$131,623.68, or \$197,104.50 less than the net earnings of the preceding year.

While the average result of sales of the year's production was \$39.62<sup>4</sup> per flask, against \$37.85 for the previous year, the cost was largely increased, being \$30.96<sup>8</sup>, against \$21.18<sup>4</sup>, a difference of \$9.15½ cents.

To manufacture 15,200 flasks 28,861 tons of ore were roasted, against 29,839 worked in the preceding year, producing 20,500 flasks.

The yield of quicksilver was only 2.014 per cent. against 2.627, and this

difference in value of the ore largely accounts for the increased cost per flask. Had the quicksilver percentage been alike for both years, we would have made last year 19,800 flasks instead of 15,200—an increase of 4,600 flasks, of which the additional cost would have been only the value of the increased number of empty flasks used, say \$2,500 then would have made the quicksilver at an average cost of \$23.77 per flask.

The actual cost per flask produced was distributed as follows: Mine pay rolls, \$18.73; Hacienda pay rolls, \$3.59; pay rolls together, \$22.32; mine supplies, \$4.44; Hacienda supplies, \$2.41; taxes and miscellaneous, \$1.86; total, \$31.03; add decrease of value of ore at furnaces, \$1.30, and we have \$32.33, from which deduct receipts from rent and miscellaneous, \$1.37, and the net average is \$30.96<sup>8</sup>.

The charges on mine pay-rolls for prospecting and deadwork were \$33,239.70, equal to \$5.47 per flask, against \$4.46 in the previous year, and the results of these large but necessary expenditures were quite unsatisfactory in both years, for few new ore bodies of importance were developed, and the probabilities for any further extension of our productive mining area were proven to be highly unfavorable.

The underground work of the mines were increased by two miles of drifting and sinking, making their total about fifty-two miles, and the 15,200 flasks of quicksilver produced, added to the previous production of the mines on the company's property, made a total of 895,918 flasks, or 68,537,727 pounds of quicksilver produced from July, 1850, to April 30th, 1889.

The total production of quicksilver in California for the year 1888 was 33,250 flasks, or 510 flasks less than in 1887, and for the four months ending April 30th last, was 8,119 flasks, against 12,025 for a like period in the preceding year, a decrease of 3,906 flasks. Should this decline in yield continue throughout the year, as now seems very probable, the production for 1889 will not exceed a total of 22,000 flasks, and, in consequence, we may expect a largely increased price.

The superintendent's report shows that 96,223.65 tons of material have been extracted from the mines during the year 1888-9; 104,490.63 tons had been extracted during 1887-8.

The tonnage of 1889-9 is divided as follows: From ore chambers, 61,273.55 tons; from dead work and prospecting, 34,950.10 tons. The 61,273.55 tons extracted from ore chambers, after being cleaned, netted: Granza, 4,731.50 tons; Tierras, 19,459.97 tons; total, 24,191.47 tons of ore, or 39.4% per cent. of the material extracted from ore chambers. From surface workings and from old mine dumps were obtained: Granza, 19,79 tons; Tierras, 4,833.82 tons; total, 4,853.61 tons of ore. These two totals give an aggregate of 29,045.08 tons of ore which were shipped to the hacienda for reduction.

Comparing this ore production with that of the previous year, there is a falling off of 2,112.52 tons. The furnaces reduced during the year 1888-9, Granza, 5,008.20 tons; Tierras, 23,853 tons; total, 28,861.20 tons of ore. In 1887-8, 29,839.55 tons of ore were reduced, showing a decrease for the past year of 978.35 tons. The average production of quicksilver from the ore was 2.014 per cent. In 1887-8 the average percentage was 2.627.

The amount of drifting and sinking done in the mine during the year was 10,994 feet, or two miles and 434 feet.

Much new ground has been opened up by these explorations; the ore discoveries, however, have been few.

SAFETY LAMPS AND SAFE EXPLOSIVES FOR COAL MINING.

The congress of miners and metallurgists has already held three sittings at the Paris Exhibition. One of these was devoted to the discussion of the various questions relating to safety lamps, as we learn from Mr. Geo. G. André in the *Colliery Guardian*. Another was occupied in the consideration of the scarcely less important question of safety explosives, and the third was taken up by the metallurgists to debate the relative merits of the several processes now in use or under trial for the dephosphorization of iron. It cannot be said that these conferences have brought any new facts to light, but they have served to confirm opinions already formed and to suggest inferences of a practical character. It is to be regretted that foreign mining engineers have not taken a larger part in this congress. The occasion was an exceptionally favorable one for the interchange of opinions and mutual instruction.

The question of safety lamps debated at the congress brought out one fact, that the members were of one mind in only one thing, namely, that a really safe lamp does not exist.

In the discussion on safety explosives, a statement was made to the effect that in the six years following 1881, 34 persons lost their lives in accidents caused by defective lamps and 194 in explosions resulting from shot-firing. Though few will admit the possibility of defining the cause of the accidents with such exactness, most will allow that the proportions here set forth are approximately true.

The use of explosives has been wholly abandoned in some places, among which may be mentioned, as important instances, the mines at Marihay and Seraing in Belgium and the Blanzay collieries in France. But the evidence adduced at the congress showed that the substitution of the *bosseyeuse* for the explosive agent leads to a higher cost of production. The *bosseyeuse* is a kind of power rock-drill capable of being applied as a hammer to drive in the wedges required to break down the rock or the coal.

The Secretary of the Explosives Commission, M. Mallard, pointed out to the meeting that the action of every explosive substance on fire-damp depends on two factors—the temperature of explosion and the time during which this temperature is maintained. Hence it is that ordinary black powder, which burns gradually, is highly dangerous, because the temperature of explosion is kept up a long time. On the contrary, in the case of the quick explosives, such as dynamite, a cartridge of which detonates in a space of time not exceeding the five-thousandth part of a second, the temperature of explosion, which is much higher than that of black powder (2,000 degrees Cent. against 650 degrees Cent.), is essentially fugitive. It is, indeed, a case analogous to that of the spark, which, though it is of a temperature above that needed to bring about ignition, yet does not ignite an explosive mixture of fire-damp and air.

Grounding their efforts on these facts, the commission have succeeded in compounding a large number of explosive substances incapable of igniting fire-damp, at least under the conditions in which the experiments

were carried out. These substances were then subjected to the test of actual experience in the mines with a view to confirm the results already arrived at, and to eliminate the least fit. Among the survivals are two, one a mixture of bi-nitro-benzol, or gun cotton, with nitrate of ammonia; the other a mixture of nitro-glycerine and nitrate of ammonia. Of these some 13 tons have been used experimentally in the Anzin Collieries, and M. François, the chief engineer, reports that for the last three months he has used no other explosive. In this fact all who know the Anzin management will find a sufficient guarantee of safety. It is, however, to be carefully noted that M. François insists on the necessity for a strong tamping to avoid the increased risks that must result from a blown-out shot.

**Big Bore-Holes.**—The Susquehanna Coal Company will drill three holes at their No. 1 Colliery, near Nanticoke, Pa. The holes are to be each 800 feet deep, 8 inches in diameter and cased with 5½-inch casing. They will be cemented according to Mr. Samuel McEachen's patent method. Two of them will be used as rope-holes and the other for speaking-tubes and signal-wires.

**An Important Electrical Decision.**—In the United States Court at Pittsburg on the 5th inst. Justice Bradley of the Supreme Court handed down an opinion dismissing the famous electric light case of Westinghouse against Edison. The suit was brought two years ago by the Westinghouse interests against the McKeesport or Edison Electric Light Company to restrain the defendants from using the fibrous carbon or incandescent conductor in the air-tight globe. The point at issue was the form and substance of the conductor. It was claimed by the plaintiffs that they had been granted a patent on the fibrous carbon, while, upon the other hand, the Edison interests claimed that they had filed an application for a patent a month before the application of the plaintiffs.

**Uranium.**—The finding of a large deposit of the rare and valuable metal uranium in Cornwall, Eng., has, by a remarkable coincidence, taken place in the centenary of the discovery of the metal. In that year of great events, 1789, Klaproth discovered the metal, and foreseeing how precious it would become, he coined for it a name out of the word Uranus, the planet then recently discovered by Herschel. At present selling prices the metal is worth £2,400 per ton, or about a pound sterling for a pound of metal. It has hitherto been found only in patches in Saxony, Bohemia and Cornwall. The discovery of the large mass in a continuous lode is not, however, likely to bring down the value of the metal, because the demand for it is much greater than can be met. It produces two oxides, with one of which delicate golden and greenish tints are imparted to glass, while the other is used for black porcelain.

**Wages at the Homestead Works.**—The *Bulletin* of the American Iron and Steel Association states that Mr. Carnegie is letting his wage-book speak for him. The scale of pay for labor in the Homestead Works for May, 1889, was as follows:

|                            | No. of men. | Total wages. | Monthly wages. |
|----------------------------|-------------|--------------|----------------|
| Converting mill.....       | 57          | \$4,642.90   | \$81.45        |
| 28-inch blooming-mill..... | 26          | 1,728.30     | 66.47          |
| 28 inch mill.....          | 32          | 1,909.73     | 59.68          |
| 33-inch beam mill.....     | 49          | 4,491.25     | 91.65          |
| 119-inch plate mill.....   | 27          | 2,312.50     | 85.66          |
| Totals.....                | 191         | \$15,084.98  | \$78.98        |

Making nearly an average of \$1,000 per year. The wages are not quite double the English scale.

**The Thames River Bridge.**—The Thames River Bridge, which was opened on the 10th inst., is remarkable as being the longest double-track drawbridge in the world. The draw span is 503 feet long and the openings for vessels are each 225 feet in the clear. The draw is flanked on either side by spans of 310 feet, and there are two approach spans of 150 feet each, making a total length of 1,423 feet. The superstructure is of steel. The deepest foundations are 103 feet, 128 feet and 130 feet, respectively, below mean water. The clear head room under the bridge is 32 feet.

The draw span weighs 1,300 net tons. It is turned by a double oscillating cylinder engine, built by Joseph Edwards, of New York. The cylinders are 7 × 10 inches. Two Frisbie clutches, operated by a hand wheel, serve to put the mechanism in gear. The main gear wheels are 36 inches in diameter. The rails at the ends of the draw span are lifted by cams, worked from the shaft which serves to operate the mechanism for seating and unseating the bridge. The lifting of this seating device and the movement of the rails are simultaneous, and are under the control of the engineer, who also puts in motion the turning mechanism. The engine room is to be furnished with an indicator showing the position of the bridge, and with signals for necessary communication with the shore.

**A Mammoth Wheel.**—The greatest wheel of its kind in the world stands in the main shop of the Dickson Manufacturing Company, in Scranton, Pa. It was built for the Calumet & Hecla Mining Company, of Lake Superior, Michigan, for the purpose of lifting and discharging the "tailings," a waste from the copper mines, into the lake, and its diameter is 54 feet, while its weight in active operation will be 200 tons. It is called a 50-foot sandwheel, but its extreme dimensions are 54 feet in diameter. Some idea of its enormous capacity can be formed from the fact that it will receive and elevate sufficient sand every 24 hours to cover an acre of ground a foot deep.

It is armed on its outer edge with 432 teeth, 4.71 inches pitch and 18 inches face. The gear segments, eighteen in number, are made of gun iron, and the teeth are machine-cut, epicycloidal in form. It took two of the most perfect machines in the world 100 days and nights to cut the teeth alone, and the finish is as smooth as glass. Mr. Sidney Broadbent, an English mechanic, who has been many years in this country, is General Superintendent of the Dickson Manufacturing Company, and the inventor of the machine with which the teeth of the great wheel were cut.

The wheel was designed by Mr. E. D. Leavitt, of Cambridgeport, Mass., the consulting engineer of the Calumet & Hecla Company. The wheel

is to be driven by a pinion of gun iron containing 33 teeth of equal pitch and face and will run at a speed of 600 feet per minute at the inner edge, where it will be equipped with 448 steel buckets that will lift the "tailings" as the machine revolves and discharge them into launders that will carry them into the lake. The shaft of the wheel is of gun iron, and its journals are 22 inches in diameter by 3 feet 4 inches long. The shaft is made in three sections and is 30 inches in diameter in the centre.

At the first glance the great wheel looks like an exaggerated bicycle wheel, and it is constructed much on the same principle, with straining rods that run to centres cast on the outer sections of the shaft. The steel buckets on either side of the gear are each 4 feet 5½ inches long and 21 inches deep, and the combined lifting capacity of the 448, running at a speed of 600 feet per minute, will be 3,000,000 gallons of water and 2,000 tons of sand every 24 hours. The wheel is supported on two massive adjustable pedestals of cast iron, weighing 12 tons each, and it is estimated that its cost at the copper mines before making a single revolution will not be less than \$100,000.

#### BOOK 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 in another page of the Journal.)

*Memoir of Dr. Douglass Houghton, First State Geologist of Michigan.* By Alvah Bradish, A. M., Detroit. Published by the author, 1889. Pages 302.

*Practical Electric Bell Fitting.* By F. C. Allsop. Published by E. & F. N. Spon, London and New York, 1889. Pages 142. Illustrated. Price, \$1.25.

*Die Legerungen in ihrer Anwendung für gewerbliche Zwecke.* By A. Ledebur, Professor School of Mines at Freiberg, Germany. Published by S. Fisher, Berlin, 1889. Pages 161.

*Der Städte-Bau nach seinen Künstlerischen Grundsätzen.* Second edition. By Camillo Sitte, Architect. Published by Carl Graeser, Weimar, Germany, 1889. Pages 180. Illustrated.

#### PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent-Office.

##### PATENTS GRANTED OCTOBER 8TH, 1889.

- 12,228. Petroleum Motor. Adolph Altmann and Fritz Kupperman, Berlin, Germany.
- 412,238. Apparatus for Vaporizing Fuel-Oil. Samuel P. Crafts, Hamden, Conn.
- 412,241. Mechanical Stoker. Isaac H. Davis, Boston, Mass.
- 412,251. Self-Lubricating Journal-Bearing. Walter L. Haldy, Cincinnati, O.
- 412,259. Uncoupling Device for Railway Cars. Eli H. Jannoy, near Alexandria, Va.
- 412,260. Means for Maintaining the Gauge of Railway Tracks. Edward A. Jenks, Newport, N. H.
- 412,261. Pavement. Samuel B. Jerome, New York, N. Y.
- 412,262. Mining Machine. John Kangley, Strettor, Ill.
- 412,283. Method of Making Wire. Charles H. Morgan, Worcester, Mass.
- 412,298. Driving Gear for Cars. Edward Samuel, Philadelphia, Pa.
- 412,300. Hydro-Metallurgical Method of Extracting Metals. Jasper H. Selwyn, London, County of Middlesex, England.
- 412,319. Mold for Cement Wrought-iron Pipes. Lambert B. Battin, Elizabeth, N. J.
- 412,321. Clay-Reducer. Walfrid Burkman, Los Angeles, Cal., Assignor to Charles H. Frost, same place.
- 412,323. Method of Electrolytically Reducing Plates for Secondary Batteries. Stanley C. Currier, Philadelphia, Pa., Assignor to the United Electric Improvement Co., Gloucester City, N. J.
- 412,341. Dredging-Boat. Alphonse Languet, Paris, France.
- 412,351. Dynamo-Electric Machine. Charles F. Winkler, Hoosic Falls, N. Y.
- 412,370. Fastening for Railroad Rails. William B. Dunning, Geneva, N. Y.
- 412,374. Discharge Apparatus for Coal or Ore Bins. John V. Ericson, Escanaba, Mich., Assignor to Pettibone, Mulliken & Co., Chicago, Ill.
- 412,383. Machine for Making Rolled Forgings. Charles E. Gould, Leominster, Mass., Assignor to the Gould Rolling Machine Co., same place.
- 412,405. Car-Coupling. William McConway, Pittsburg, Pa.
- 412,415. Rolling-Mill for Car Wheels. Benjamin F. Rittenhouse, Norristown, Pa.
- 412,434. Ore-Concentrator. James Tulloch, Angel's Camp, Cal.
- 412,447. Process of Dephosphorizing Iron. George Archbold, New York, N. Y., Assignor to Hiram Gilbert Bond, same place.
- 412,448. Process of Dephosphorizing Iron and Steel. George Archbold, New York, N. Y., Assignor to Hiram Gilbert Bond, same place.
- 412,471. Clay Pulverizer. Jonathan Creager, Cincinnati, Ohio.
- 412,474. Air Compressor. Uriah Cummings, Buffalo, N. Y.
- 412,481. Hydrocarbon Burner for Furnaces. John B. Deeds, Terre Haute, Ind., Assignor of one-half to John C. Watson, same place.
- 412,492. Car Coupling. Simon J. Freeman, Bradford, Pa.
- 412,508. Method of Boring Undercut Holes in Metal. Henry James, New Haven, Conn.
- 412,517. Pneumatic Tool. James S. McCoy, New York, N. Y., Frank H. Marsh, Newark, N. J., and George H. Williams, New York, N. Y., Assignors to the American Pneumatic Tool Company, of New York.
- 412,524. Device for Excavating Coal, etc. Thomas McBride, Philadelphia, Pa., and Ebenezer Fisher, Kincardine, Ontario, Canada.
- 412,525. Apparatus for Operating Derricks or Cranes. Thomas McBride, Philadelphia, Pa., and Ebenezer Fisher, Kincardine, Ontario, Canada.
- 412,528. Electric Motor for Railway Cars. William McDonald, East Orange, N. J.
- 412,538. Dredging-Scraper. Thomas Potter, Jersey City, N. J.
- 412,566. Mold for Ingots. Henry C. Tallman, Cranston, Assignor to Charles F. Irons, Providence, R. I.
- 412,568. Ore Crusher. James A. Vaughn and Calvin V. Vaughn, Cuyahoga Falls, Falls, Ohio, Assignor to Turner, Vaughn & Taylor, same place.
- 412,586. Registering and Indicating Device for Mines, etc., William F. Bath, Wardner, Idaho.
- 412,599. Process of Electric Welding. Charles L. Coffin, Detroit, Mich.
- 412,602. Well Drilling Rig. George Corbett, Bradford, Pa.
- 412,605. Electric Railway. Leo Daft, Plainfield, N. J.
- 412,610. Apparatus for Applying Chlorine to the Extraction of Gold from Ores. James B. Hannay, Cove Castle, Loch Long, County of Dumfries, Scotland.
- 412,621. Trimmer or Gatherer for Coal Elevators. Lyman D. Howard, Brooklyn, N. Y., Assignor to the Clark-Howard Excavator and Conveyor Company of New Jersey.
- 412,636. Railroad Rail. Hosea W. Libbey, Boston, Mass.
- 412,637. Railroad Rail and Chair. Hosea W. Libbey, Boston, Mass.
- 412,643. Method of and Apparatus for Extracting Gold. William A. Merralls, Kansas City, Mo.
- 412,666. Electrical Railway Conduit and Current Plow. Jesse W. Reno, Denver, Colo.
- 412,669. Thermo-Electric Generator. William S. De L. Roberts and James S. Mollison, Sydney, New South Wales.
- 412,687. Apparatus for Casting Metals. Sydney W. Wilkinson, Sheffield, County of York, England, Assignor of two-thirds to John B. Foxwell, East Orange, and Frank Wilkinson, Orange, N. J.



PERSONALS.

A National Silver Convention will be held in St. Louis, Mo., on November 26th.

Mr. James Montgomery has resigned as superintendent of the Ohio Valley Railway, and Mr. W. W. Hegemann, who has been connected for many years with the Baldwin Locomotive Works, has accepted the offer to fill the vacancy.

Mr. George Ropes, architect of the State Capitol at Topeka, Kan., advertises for two designs for sculptures to fill two pediments, and one for a statue to surmount the dome. With them are to go sealed proposals for the execution of the sculptures, to be addressed before November 6th, 1889, to the Secretary of the Board of State House Commissioners in that city. Mr. Ropes will furnish a circular containing conditions and instructions.

Mr. Charles M. Schwab, a young man of twenty-seven years, has been appointed General Superintendent of the Edgar Thomson Steel Works of Carnegie, Phipps & Co. Mr. Schwab succeeds the late Capt. William R. Jones, to whose death we referred in our last issue. Captain Jones was paid \$25,000 a year. His successor, who will have charge of the 8,000 men employed at the Edgar Thomson and Homestead Steel Works, has been with the firm for eight years past, and was Captain Jones' chief assistant. He is a graduate of St. Aloysius' Academy, Loretta, Pa.

The thirty-eighth meeting of the American Institute of Electrical Engineers will be held October 15th, at 8 o'clock P. M., in Dr. Doremus' Lecture Room, College of the City of New York, No. 17 Lexington avenue. A paper will be read by Mr. Thomas D. Lockwood, member, entitled "Electrical Notes of a Transatlantic Trip." It will embrace some observations on telegraphy, description of the London operating room, the different instruments employed, the pneumatic tubes, and a brief discussion of governmentally owned telegraphs; electric lighting as carried on in England, the practice of telephony in Great Britain, certain peculiarities in apparatus and methods; also the use of electric motors. Some of the electrical features of the Paris Exposition will also be canvassed.

The Astronomical Society of the Pacific was founded last February in San Francisco as a result of the cordial co-operation of amateur and professional astronomers in successfully observing the total solar eclipse of the preceding New Year's Day. It is now sought to continue that association, both as a scientific and as a social force. Any person who takes an interest in astronomy is invited to join its membership, whether he has made special studies in this direction or not. Three meetings a year (March, November, January) are held in San Francisco, at the rooms of the society; and three meetings (May, July, September) at Mount Hamilton, where an opportunity is afforded to the members to see and use the instruments of the Lick Observatory. Publications are printed in octavo form at irregular intervals; it is said that one hundred or more pages a year may be expected.

OBITUARY.

Charles Osborne, a well-known mining man of Pinos Altos, New Mexico, whose correct name is said to have been Carl Osber, is dead.

Thomas S. Acheson, manager of the Ball Electric Lighting Company, of New York, died of heart failure at his residence in this city on the 9th inst.

Samuel J. Cresswell, aged 48 years, the manufacturer of building iron and machinery, of Philadelphia, was stricken with apoplexy on Thursday, and died soon after.

W. H. Baker, superintendent of the Syracuse Forging and Gun Works, at Batavia, died at his home in that village on the 10th instant, aged 53 years. He was the inventor of the new Baker gun.

Professor Joseph Everett Nourse, U. S. N., died at his home in Georgetown, D. C., on the 8th inst. Professor Nourse was born in Washington on April 17th, 1819. He was professor of ethics and English studies in the Naval Academy from 1850 to 1864, when he was commissioned professor of mathematics. In 1875 he represented the government at the International Geographical Congress in Paris. He published numerous scientific works.

D. C. Linsley, the president and promoter of the People's Rapid Transit Railway Company, which contemplates a viaduct railroad through New York City, died on the 9th inst. Mr. Linsley was born in Middlebury, Vt., about 1829, and became prominent as a railroad engineer. He was engineer-in-chief of the Northern Pacific Railroad, built the Illinois Central and Lebanon Springs and Bennington roads, was at one time engineer of the Vermont Central, and at another time general manager of the Canada & Atlantic Railroad Company.

Norman W. Wheeler, for many years prominent in mechanical engineering and marine architecture in New York, died on the 7th inst. at his home, Brooklyn, in the sixtieth year of age. Mr. Wheeler was born in the year 1829 in the western part of this State. His early life was spent in Wisconsin and Ohio, where he learned the trade of machinist. During his busier days he invented many of the most important improvements in the steam pumps now in use. In the early part of the Civil War he designed the engines and other

machinery of the ill-fated double-turreted United States iron-clad ram Keokuk, which sank during the first attack by a Federal fleet on Charleston. Later he designed all the new transports built for the United States government by the Cramps, of Philadelphia. After the war he became identified with marine interests on the Great Lakes, and designed some of the most successful of the huge iron vessels built by the Union Dry Dock Company, of Buffalo.

INDUSTRIAL NOTES.

The Eliza furnace property, Wellston, Ohio, will be offered for sale on November 2d next.

The second stack of the Wellston Iron Company, Wellston, Ohio, will soon be ready to put in blast.

Messrs. Karnap & Baxter, of Ashland, Ky., have purchased machinery and will enter into the manufacture of galvanized iron cornices.

A very important exhibition opened this week in Philadelphia, Pa., at Memorial Hall. It shows the advances made in the United States within the last ten years in pottery, porcelain, tiles and stained glass for windows.

Wellston Furnace No. 2, at Wellston, Ohio, under lease to King, Gilbert & Warner, of Columbus, will soon be put in blast. At present it is undergoing thorough repairs.

The Delmont Kaolin Company, of Sea Cliff, L. I., and New York, N. Y., which has bought the Carpenter estate, situated at Sea Cliff, it is reported, has mortgaged the property for \$500,000, and expects to erect a factory for the manufacture of pottery, etc.

Messrs. Carnegie, Phipps & Co., Limited, of Pittsburgh, it is said, will soon make some important improvements in their Homestead Steel Works, at Homestead, Pa. The most important will be the increasing of the size of rolls so that 30-inch beams can be rolled.

The general offices, press rooms, packing rooms, blacksmith shop, machine shops, store rooms, laboratory and car shops of the Oliver Brothers & Phillips' iron works, at Pittsburg, Pa., were completely destroyed by fire on the 7th inst., causing a loss estimated at \$300,000.

The Warwick Furnace, at Pottstown, Pa., which was blown out May 28th, to be repaired and re-modeled, was relighted on the 5th inst. The furnace went into operation fourteen years ago. It is thought the enlargement and improvements just made will increase its output at least 20 per cent.

The Chrome Steel Works, Brooklyn, N. Y., sole manufacturers of the famous Chrome steel, have just shipped three carloads of their well-known adamantine (Chrome steel) shoes and dies to the Alaska Mill and Mining Company, Tacoma, Wash. H. D. Morris, of San Francisco, who represents the Chrome Steel Works on the Pacific Coast, secured the order.

The final transfer of the Minnesota Car Company property to the Minnesota Iron Car Company took place at Duluth, Minn., on the 7th inst. George W. Ettinger becomes treasurer and R. L. Ettinger general manager of the new company. The capital stock is \$2,000,000; cash paid in, \$1,000,000. The works, which cover many acres, are of the most modern construction and filled with the latest improvements in the line of machinery. It will be the most extensive car works in the Northwest.

The Salem Furnace Company, of Salem, Va., has purchased 2,571 acres of the best developed mineral property in Virginia, located four miles from Salem, and has let to contract the erection of a 14-foot 6-inch by 75 foot furnace to the American Bridge Company, of Roanoke. This furnace will be the most complete plant in the district, having excessive engine and stove power, and having every tried and labor-saving device. In the matter of labor alone, the company advises us it will save 50 cents a ton as compared with the cost at neighboring plants. Mr. D. B. Strouse is President, and Mr. F. E. Bachman, Manager.

CONTRACTING NOTES.

Manufacturers of machinery, engineers and contractors should consult our directory of "Contracts Open" on page xx. This week proposals are invited for the following work: Sewerage System; Coal; Steel Castings; Road; Cross Walks; Bridge; Sewer Construction; Grading; Paving; Sewer.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want" will be published in this column.

Any manufacturer or dealer wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office.

No charge will be made for these services.

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

them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

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.

AMERICAN GOODS WANTED ABROAD.

233. Pump, to pump 50,000 gallons per day (10 working hours) a distance of four miles, with an elevation of 500 feet, engine and pipe; state price f.o.b. New York, also freight by car lot, to Guaymas and to Hermosillo, Mexico.

234. Mine pump. Mexico.

235. Catalogues, mining machinery, pans and settlers, shoes and dies. Mexico.

247. Catalogues of brick-making machines. Mexico.

239. Shooks wanted. Size and thickness of wood for boxes: 30 gross lots No. 4, side, 10 x 3 1/2 x 1/2 in.; ends, 5 x 3 1/2 x 1/2 in.; bottoms, 10 x 5 1/2 x 1/2 in. 30 gross lots No. 7, sides, 11 1/2 x 1/2 in.; ends, 6 x 1/2 in.; bottoms, 11 1/2 x 1/2 in. 10 gross lots No. 8, sides, 12 x 4 1/2 x 1/2 in.; ends, 6 3/4 x 4 1/2 x 1/2 in.; bottoms, 12 x 6 3/4 x 1/2 in. 10 gross lots No. 10, sides, 14 1/2 x 4 1/2 x 1/2 in.; ends, 6 3/4 x 4 1/2 x 1/2 in.; bottoms, 14 1/2 x 6 3/4 x 1/2 in. Australia.

260. Particulars, prices, etc., wanted of a new gun and blasting powder, invented by Mr. Hengst—, Sydney.

261. Parties wanted, to arrange for a private brand of oil. Sydney.

GOODS WANTED AT HOME.

248. Engine, 15 H. P., that regulates well and is economical in the use of steam. North Carolina.

249. Wood-working machinery; sash, door and blind outfit; a wood-turning lathe, a hand-saw, a jig or scroll saw and resawing machine for siding. North Carolina.

250. Engine, 1/2 to 3/4 H. P. Kentucky.

251. Addresses of well-borers and manufacturers of well-boring machines. Alabama.

252. New or second-hand mining machinery; two 60 H. P. boilers, one 40 or 60 H. P. hoisting engine, 12 T-rails, wire rope, sheave wheels, mine cars, elevator chain, sprocket wheels, buckets, steam pump, etc. Alabama.

253. Saw mill, with engine and boiler complete, with capacity of 6 to 10 M. feet lumber per day. Alabama.

254. Engine, 4 or 5 H. P., for foundry. North Carolina.

255. Catalogues of boilers, engines, shafting, wooden and iron pulleys. West Virginia.

256. Names and addresses of firms who make a specialty of iron canal headgates. Utah.

257. Quarrying machinery; 12 gangs of saws and possibly 2 rubbing beds. Tennessee.

258. Hoisting engines and boilers, 10 and 20 H. P., crusher, lead-smelting furnace, 5 to 10 tons capacity; a reversible hoist wheel, buckets, rope, etc., and miners' oil. Catalogues of mining machinery, stating net prices.

265. Heating apparatus, furniture, etc., for a hotel now being built. Virginia.

266. Wanted, one mile 2 in. wrought iron water-pipe; two miles of 4-in., 6-in., 8-in. and 10-in., and one mile of 12-in. C. I. water-pipe, all sizes; 1/4-in. to 4-in. gas-pipe, and malleable iron fittings, lamps and lamp posts. Virginia.

267. Boiler, engine, pump, pipe, etc.; 20 horse-power horizontal boiler and 20 horse-power engine; inspirator, belt, pump, and necessary piping. Price, delivered in Georgia, to be stated.

268. Electric street railway; complete equipment, two miles, 30-pound steel rails. Virginia.

269. Machinery and supplies; bank cars, coal machines, pumps, rails, spikes, picks, shovels, and augurs. Alabama.

270. Roofing. Alabama.

271. Powder, caps, and fuse. Alabama.

272. Oil and mining lamps. Alabama.

273. Lead smelting furnace, also one to reduce nickel ore. Kentucky.

274. Brick dryer with daily capacity of 40,000 brick. Tennessee.

275. Second-hand iron lathes, drill press, planer and machinist tools for repair shop. Alabama.

276. Pipe, etc., 2,000 feet 2-inch gas pipe, gasometer and regulator. Kentucky.

277. Wood-working machinery, full set for planing mill with engine and boiler for running same. Virginia.

278. Hot-air engine or other power to pump water. Georgia.

279. Floor tiling. Georgia.

280. Felting to put under tin roof. Georgia.

281. Furniture and carpets. Georgia.

282. Cook range and boiler. Georgia.

283. Insulators, brackets, wire, etc. Alabama.

284. Fan for supplying planer shavings to boiler furnace. North Carolina.

285. Engine and boiler, 60 horse-power. Alabama.

286. Engine, boilers, shafting and pulleys, 100 horse-power engine; 125 horse-power boiler, and 100 horse-power boiler. Indiana.

287. Brick machines, etc. Three or four brick machines, one repressing machine and other articles incident to the manufacture of brick. Capacity of plant about 100,000 brick per day. Indiana.



## GENERAL MINING NEWS.

Shipments of iron ore from the mines of the district mentioned below for the season up to and including October 24, as reported by the Marquette, Mich., Mining Journal, were as follows:

|                                   | Tons.<br>1889. | Tons.<br>1888. |
|-----------------------------------|----------------|----------------|
| Marquette, Marquette District.... | 1,142,330      | 639,451        |
| St. Ignace, " " " " " " " "       | 39,445         | 94,051         |
| Escanaba, " " " " " " " "         | 770,340        | 642,655        |
| *Gladstone, " " " " " " " "       | .....          | .....          |
| Menominee District.....           | 35,297         | .....          |
| Escanaba, " " " " " " " "         | 1,294,387      | 833,088        |
| " " " " " " " " " " " "           | 215,650        | 139,643        |
| Ashland, " " " " " " " " " " " "  | 1,258,218      | 863,742        |
| Two Harbors, Vermillion District. | 690,823        | 299,671        |
| Total, tons.....                  | 5,361,440      | 3,572,301      |

\*The shipments from Gladstone, Marquette District, are shipments from the Republic mine, and from Gladstone, Menominee District, shipments from the Chapin and Ludington mines.

## CALIFORNIA.

## AMADOR COUNTY.

**PLYMOUTH CONSOLIDATED GOLD MINING COMPANY.**—From a circular issued by the company, and dated September 30th, we take the following: The financial statement to September 1st shows: Gold bullion produced from February to August, \$120,178.02; indebtedness January 1st, 1889, \$15,446.93; expenses from January to August, \$88,653.05; surplus, \$31,524.97. The item of expenses for July includes an amount (\$19,059.28) paid for timber received that month. It is our custom to contract several months in advance for timber needed the following year, and to be delivered during the summer. Our usual bill for timber is about \$33,000 per annum when in full operation. Advices from Plymouth show that a serious caving of rock in the lower levels took place in August. The character of the slate, which is the enclosing rock, is such that heat or water disintegrates the slate and causes it to crumble. After the recent fire a considerable amount of work was done in the lower levels, notwithstanding their unsafe condition, until the break above referred to occurred. The superintendent says: "A large section of the hanging wall has broken off and closed all our stopes, consequently stopping the running of the mill for the present. The whole country round our openings is in such a state, in consequence of the great damage done by the fire, that it will be next to impossible to extract any ore for some time. Will have to wait until the ground gets thoroughly settled." The only course to be pursued with regard to the workings is to wait, and to direct our attention to new work. On the 16th of August a winze was commenced, the intention being to sink into the ore sufficiently to a certain its character and location, with a view to sinking the shaft to another (1,700) level. That work is now in progress, and we hope soon to know what the prospect is for another and entirely new level. Meanwhile we are pushing the tunnel toward the "Indiana" portion of our ground. This tunnel is being run from No. 2 level (1,157 feet under the surface), on the lode line, with the hope of striking a body of ore supposed to exist in the "Indiana" claim. Should our hopes be realized this will furnish rock to keep the mills running till the old mine can be worked again. At last advices this tunnel had been run 375 feet. The company's valuable machinery and plant are intact, and in thorough working order. Our work has been much hindered for two months past by the prevalence of an epidemic of malarial fever, which has reduced our working force below our needs. This is only temporary, however, and will disappear with the coming of winter. The sole management of the operations at the mine are now, as heretofore, under the care of Messrs. Hayward and Hobart, two of the directors of the company.

## BUTTE COUNTY.

**BIG BEND TUNNEL AND MINING COMPANY.**—Dr. Ray V. Pierce, the president of this company, to which we referred in our issue of September 28, says that the statement that the enterprise has collapsed is misleading. The company, he says, "can pay all its debts, if it has any. It is perfectly solvent. We have still a valuable property, some 4,000 acres of territory, which can be utilized to advantage for irrigation and other purposes."

## NEVADA COUNTY.

**CROWN POINT MINING COMPANY.**—This company has been organized by Mr. Joseph Bonivert, who has bonded the Crown Point mine at Grass Valley. The new company has nine months in which to complete the purchase of the mine, the price being \$66,000. The company has purchased the machinery on the Badger mine, and will remove it to its shaft, the work to be instituted at once.

**EMPIRE.**—The shaft on this property, said to be the oldest working mine in Grass Valley district, is down 1,850 feet, and the depth is being added to at the rate of 40 feet monthly. Sinking will be continued steadily until the mine is 2,000 feet in depth.

**GRASS VALLEY SYNDICATE TUNNEL COMPANY.**—This company has been organized, with a working capital of \$3,000,000, with which to carry ahead the construction of the drain and mining tunnel projected by the Nevada City and Grass Valley Gold Bank Tunnel Company. The tunnel will be started on the South Yuba River, at a point about 2,000 feet below Hoyt's Crossing, and run a large tunnel, having an average vertical depth below the surface of 1,600 feet, and being 2,000 feet down at the deepest point. The line of the tunnel, which is eight miles in length as outlined, is through the Providence group of mines on Deer

Creek, thence traversing a portion of the Gold Flat District, through the Idaho, Empire and other claims, then down along somewhat the same course as that described by Wolf Creek to the Allison Ranch mine.

## SIERRA COUNTY.

**MOUNTAIN.**—It is stated that an English syndicate has purchased this mine, an extension of the Young America of this county. Harry Warner was the owner and bonded the property to O. Sunderhaus and others for \$100,000, receiving \$15,000 in cash as an evidence of good faith. Messrs. Sunderhaus & Co. developed the mine to some extent, and have now sold it, according to California papers, for \$150,000. A 40-stamp mill will be put up in the spring. The Englishmen are said to be anxious to secure the Young America.

## COLORADO.

**AN ENTRY FOR MILL SITE PURPOSES IS NOT SUSTAINED.**—Secretary of the Interior Noble at Washington, on the 5th inst., rendered a decision in the case of Ernest Leneve Foster, appealed from commissioner general of the land office and involving mineral entry No. 3047, Central City, Colo. At the land office on June 12, 1886, Mr. Foster made a mineral entry for a mill site, claiming two and fifty-five hundredths acres known as the Leneve mill site. On August 14, 1888, the commissioner of the general land office directed the register and receiver of the Central City land office to notify the claimant that there was no evidence on file in the case showing that there was a quartz mill or reduction works on said claim, and that claimant be allowed sixty days to furnish satisfactory evidence. Mr. Foster claimed that said mill site was used for mining purposes, there being upon the same machinery and pipe, which was used for driving a water wheel to compress air for the engine and drills in mining upon adjacent lodes, and that said machinery had been erected at a cost of \$20,000. The Secretary of the Interior affirms the decision of the commissioner of the general land office, holding said entry for cancellation on the ground that the improvements described are not the kind of improvements contemplated in the last clause of section 2337, revised statutes. The Secretary further says: "From anything appearing in record to the contrary, appellant may be able to obtain patent by making proper application and proof under provision of first clause in said section 2337."

## BOULDER COUNTY.

**PUZZLER GOLD MINING COMPANY.**—From a circular issued by this company we condense the following: "The properties consist of two adjacent lode claims, each 1,500 x 150 feet in area, on the Puzzler gold vein. Also a mill site and a placer claim. The total area comprises thirty-five acres in the west district. The ore is of two kinds—gray, friable quartz carrying free gold and auriferous pyrites disseminated through it, milling ore; and nearly solid auriferous pyrites (both iron and copper), smelting ore. The smelting ore is shipped to Denver, while the milling ore must be treated at the mine. As yet the company has no mill, but one is to be built out of a portion of the money realized from the sale of the stock. The Puzzler was discovered in August, 1885, and active work was begun in the fall of 1886. In December of the same year the first shipment of ore was made, and the mine has been worked steadily ever since. The total gross shipments to date amount to 306 tons, netting returns of \$22,788.64. Out of this the mine has been explored, developed and patented. One-fifth of the capital stock (100,000 shares), which is registered as treasury stock, will be offered for sale and started at 20 cents per share. It is expected to have the mill in operation by March 1st, and to list the stock at the Denver Mining Exchange." [We also note that a dividend is predicted for October 5th. Is this another of the wildcats of the Denver Exchange?—Ed. E. & M. J.]

## CLEAR CREEK COUNTY.

**TWO SISTERS MINING COMPANY.**—An application for an injunction by John H. Bowman against this company, involving the Joe Reynolds No. 4, Native American and the Two Sisters lode mining claims, situated in Clear Creek County, was to have been heard at Central City on October 5th, but the defendant, the mining company, obtained the removal of the case to the United States Circuit Court. The plaintiff claims that the apex of the lode being worked by the defendant is within plaintiff's side lines.

## GILPIN COUNTY.

**HUBERT MINING COMPANY.**—This company, since sinking the last 100 feet in the main shaft, has its platts put in at the 950-foot station, and is now extending levels both east and west at that depth. It has now 60 stamps in operation, as follows: Company mill, 25 stamps; Hidden Treasure, 25 stamps; New York mill, 10 stamps. A new Gilpin County ore concentrator has recently been put in the company's 25-stamp mill, which makes three that are now in use. Recently, according to local papers, a 10-ton lot of blank tailings sold to the smelters from this mill netted \$2,500, or an average of \$250 per ton.

**JUSTICE MINING COMPANY.**—Superintendent Sparks reports that the new and main shaft on the Justice mine in Lake district is now down to a depth of 120 feet, 30 feet of which has been sunk since the erection of the new shaft building and the placement of a plant of machinery. A level west from the east shaft at a depth of 220 feet is being driven to strike the main shaft, which is distant 380 feet. It is now in a distance of 280 feet and will cut the latter shaft at a depth of 260 feet, the elevation being 40 feet.

## HINSDALE COUNTY.

**GOLD POINT MINING COMPANY.**—The stock of this company located at Lake City, Hinsdale County, has been listed on the St. Louis Mining Exchange. The

company is capitalized with 1,500,000 shares, non-assessable, and, it is said, has 46,000 shares unsold stock and \$862 cash in the treasury. The developments are small. The officers are J. J. Campbell, president; L. D. Hicks, vice-president, and W. P. Hancock, secretary. St. Louis parties are interested in the enterprise.

## LAKE COUNTY.

The Secretary of the Interstate Commerce Commission at Washington has received by mail from Patterson & Thomas, Denver attorneys, a copy of a complaint against the Denver & Rio Grande Railroad for a violation of the provisions of the Interstate Commerce Law, brought in the name of four smelting companies of Leadville, Colo., viz.: The American Mining and Smelting Company, Arkansas Valley Smelting Company, Harrison Reduction Works, and the Manville Smelting Company. The complaint charges a discrimination by the Denver & Rio Grande Railroad Company against the Leadville Smelting Company and in favor of the Salt Lake Smelting Company. The present through rate for bullion from Leadville to the Missouri River, the complaint charges, is \$16 per ton, of which the connecting lines east of Denver or Pueblo take one-half the rate. From Salt Lake City to Kansas City, by the Denver & Rio Grande, it is only \$13 per ton, of which the connecting line takes \$8 per ton. The Arkansas Valley Smelting Company ships 1,100 tons per month, the American Mining and Smelting Company 900, and Harrison Reduction works 600, and Manville Smelting Company 400. All the Salt Lake companies combined, it is averred, ship only 1,000 tons per month. The complaint further alleges that the route from Leadville to Denver is down grade, while from Salt Lake to the Salida railroad it crosses two ranges of mountains and has steep grades and heavy curves, requiring heavy outlays of money in cost of construction, keeping in repairs, and operating. The complaint then calls attention to the difference in distance between Salt Lake to Salida and Leadville to Salida. For these reasons the complainants charge an unjust discrimination and violation of the provisions of the Interstate Commerce law. The complaint is signed and sworn to by Henry I. Higgins, president of the American Mining and Smelting Company. The Denver & Rio Grande Railroad Company will have twenty days within which to file answer to complaint.

**BREECE MINING COMPANY.**—At the annual stockholders' meeting, held in New York City last week, the following board of trustees was re-elected: Chas. A. Rogers, F. B. Whitfield, Henry Bradstreet, N. Dana Whipple, Geo. H. Phelps, and A. H. Rogers. Mr. Chas. A. Rogers was elected president, Mr. Whitfield, vice-president, and Mr. Bradstreet, secretary and treasurer. Secretary Bradstreet informed an ENGINEERING AND MINING JOURNAL reporter this week that the annual reports which were presented showed that the company is entirely freed from debt, but work on its property has been suspended pending an improvement in the iron ore market.

**IRON SILVER MINING COMPANY.**—Much depends on the present development work in this mine, and the opening up of the iron sulphide chute means much to the contiguous properties. So far, it is said, no limit has been found to this ore chute, though drifts are being rapidly driven ahead to the ways on the line of the strikes of the chute. The drift south and west on the chute is still in ore, as that on the north and east side. A great deal more lead is met with in the ore. Most of the stoping is being done in the eleventh level winze workings. In the north branch of the 130-foot level, which is a hundred feet above the sixth level of the old mine workings, another streak of ore is being followed with promising prospects.

**SILVER CORD COMBINATION MINING COMPANY.**—A large amount of developing and exploring work is being done on this property. The workings near the Willard claim are said to be almost surrounded by ore bodies, notably that of the Colonel Sellers and Smuggler ore chutes, while on the upper levels good indications of striking a body of carbonate are met with, particularly in the 1,100-foot level. In the upraise started from the incline to connect with the Gros shaft, some ore is found, drifting on which is being rapidly driven ahead.

## FITKIN COUNTY.

**EMPIRE.**—A strike is reported in this mine on Smuggler Mountain. The property lies between the Iowa and the St. Joe, and is under lease to F. Fitzgerald, of Aspen; Louis Heilm, of St. Louis, and others.

**SCHILLER.**—Mr. O. O. Bowman, one of the principal stockholders of the company, arrived from Trenton, N. J., recently, for the purpose of examining the property. The present development consists of a shaft 600 feet deep, and an incline of 140 feet, which is now in blue shale.

## SUMMIT COUNTY.

**ORO MINING AND MILLING COMPANY.**—A successful mill on low grade refractory zinc ores, said to be in operation at this mine since last May. Although some of the crude ores carry as high as 30 per cent. zinc, it is claimed that all but 1½ per cent. of the latter substance is eliminated from the concentrates. The capacity of the mill is seventy-five tons every twenty-four hours, but this will be increased to 150 tons, it is said, in the next few months. The company is composed principally of New York parties, who took hold of the property last February.

**OURAY.**—The workings of this mine cross Brooks' Hill, in Minnesota mining district, from Illinois Gulch



(where extensive placer mining has been done in years past) to Illinois Park on the west. It is owned mainly by Mr. T. D. Price, of St. Louis, and has been worked steadily, says the *Denver Republican*, for two years past under the management of Mr. H. B. Scott, one of the original discoverers. Over 800 feet of development work has been done on the vein in the way of tunnels and upraises. The main tunnel, about 170 feet below the surface, is over 400 feet long. No stoping has as yet been done.

**DAKOTA.**

**LAWRENCE COUNTY.**

**MONITOR MINING COMPANY.**—The Monitor group of mines, says the *Deadwood Pioneer*, are located in Goldfinch gulch, near Terraville, and join both the Pluma and Caledonia property. They consist of nine claims and fractions. Cassels fraction and an interest in the Gentle Annie lode have been just purchased by the company. The Monitor mine was located in 1877, but it was not worked much until the following year, since which time work has been going steadily forward. There is one tunnel in to a distance of over a thousand feet and numerous drifts and cross-cuts. Twelve men are now employed in the mine, getting out on an average of 40 tons per day, which is about the capacity of the 25-stamp mill located in Central City. Considerable development work is being done and getting the mine in shape to work a larger force of men, as it is the intention to erect a larger mill, probably with sixty stamps, in the near future. The clean up from 1,200 tons of ore crushed during August amounted to \$11,800.

**INDIANA.**

The strike of the block coal miners at Brazil has entered on its sixth month, and the idle men seem as determined as ever. Some of those at work are being induced to quit, and the strikers still demand arbitration.

**KENTUCKY.**

Mr. William Mahl, assistant to C. P. Huntington, from New York, recently visited the Eastern Kentucky coal fields on the Big Sandy River.

**MARYLAND.**

**FREDERICK COUNTY.**

Large deposits of iron ore, it is reported, have been discovered on a number of farms in Middletown Valley, in this county. A portion of the land has already been leased to a Baltimore syndicate, according to press reports, and the Cambria Iron Company is also negotiating.

**MICHIGAN.**

**COPPER MINES.**

The September product of mineral of the Lake Superior copper mines, according to the *Boston Transcript*, is as follows:

|                      | September |       | Jan. 1 to Sept. 30. |        |
|----------------------|-----------|-------|---------------------|--------|
|                      | 1889.     | 1888. | 1889.               | 1888.  |
|                      | Tons.     | Tons. | Tons.               | Tons.  |
| Calumet & Hecla..... | 2,933     | 3,254 | 24,162              | 23,617 |
| Quincy.....          | 325       | 356   | 2,511               | 2,985  |
| Oscuela.....         | 220       | 192   | 1,840               | 1,841  |
| Franklin.....        | 203-      | 180   | 1,536               | 1,218  |
| Atlantic.....        | 193       | 201   | 1,971               | 1,916  |
| Allouez.....         | 142       | ...   | 1,145               | ...    |
| Huron.....           | 116       | 116   | 934                 | 952    |
| Kearsage.....        | 90        | 101   | 850                 | 173    |
| Total, 8 mines....   | 4,222     | 4,400 | 34,689              | 29,568 |

This total includes all but two of the Lake Superior mines now producing, the Tamarack and the Peninsula. Including their estimated outcuts (Tamarack 600 tons, Peninsula 55 tons), and comparing with last year, we have this approximate record of Lake Superior copper production in September and the first nine months of the year:

|                                     | 1889.  | 1888.  |          |
|-------------------------------------|--------|--------|----------|
|                                     | Tons.  | Tons.  |          |
| September.....                      | 4,877  | 5,176  | Dec. 299 |
| January 11th to September 30th..... | 40,921 | 39,038 | Inc. 883 |

The 1888 totals include the Copper Falls and Central product, and the 1889 figures include the amount of product of these mines as made this year, before suspending output. The Central probably will resume producing this month, as it was shut down to straighten the shaft.

**CALUMET AND HECLA MINING COMPANY.**—The fourteenth stamp head has been started in the stamp mill of this company, where but eleven were at work a week before. The additional heads of stamps now in operation at the mills, if supplied with rock, mean a product of fully 3,500 tons of mineral per month.

**MISSOURI.**

**CHEROKEE BRILLIANT COAL AND MINING COMPANY.**—Suit has been instituted by the assignee of this company against the Kansas City, Ft. Scott & Memphis Railroad for \$100,000 damages, alleged to have been sustained by the coal company through discriminating in freight rates in coal in favor of the Keith & Perry Coal Company, and to the great loss, etc., of said Cherokee Coal Company, through which said company was forced into insolvency.

**MONTANA.**

The Great Falls & Canada Railway Company was incorporated at Great Falls, Mont., on the 6th inst., with \$2,500,000 capital. According to a press dispatch, the company will build a railroad from Great Falls to the Canadian line, whence the same parties will build to the coal mines at Lothbridge, Canada, which is connected with the Canadian Pacific by a railroad 110 miles long. The principal incorporator is Donald Grant, the well-known railroad builder. The main purpose of the road is to provide an outlet for the coal fields at Lothbridge. The new road will pass west of the Sweet Grass region in Chateau County, and will

be used to distribute coal from Great Falls over points reached by the Manitoba, Montana Central and the Northern Pacific. The work will be commenced as speedily as the season will admit.

**BEAVERHEAD COUNTY.**

**CARLISLE GOLD MINING COMPANY.**—The London directors of this company state that the Phil Shenon mines, to which we referred in our last issue, have been bonded for \$150,000; terms, \$7,500 down, \$20,000 November 21st, \$27,500 May 1st next year, \$45,000 November 1st, 1890—\$50,000 in shares.

**DEER LODGE COUNTY.**

**SILVER BELL MINING COMPANY.**—This company has indebtedness amounting to \$15,000. The company is capitalized at \$2,000,000, divided into 400,000 shares. The assets are the Silver Bell mine and mill site.

**JEFFERSON COUNTY.**

**HELENA & LIVINGSTON SMELTER AND REDUCTION COMPANY.**—This company files the following annual report. Assets: 330 acres of land in East Helena with improvements, \$400,000; all stock of the L. C. & C. Company, 500,000; 625,000 shares of Helena Mining & Reduction, \$300,000; Gregory & Banner mines, \$75,000; Alta & Corbin Railway, \$25,000; ores, mattes and bullion, \$475,000; total, \$1,775,000. Liabilities, including advance on ores and bullion, \$575,000. The statement is signed by O. R. Allen, secretary; A. J. Seligman, treasurer, and the trustees.

**HELENA MINING AND REDUCTION COMPANY.**—This company has an indebtedness amounting to \$134,400 in bonds bearing interest, payable semi-annually. The capital stock is \$3,315,955, divided in 663,191 shares at \$5 each.

**LEWIS AND CLARKE COUNTY.**

**IRON MOUNTAIN MINING COMPANY.**—The annual statement of this company, filed at Helena, shows that the capital stock is \$5,000,000, whole amount paid in by the purchase of mines and expenditures for improvements for which a United States patent has been applied for. The capital is divided into 500,000 shares, 100,000 being treasury stock, and 400,000 are outstanding with different holders. The report is signed by Thomas Cruse, Samuel Word, M. E. Downs, and R. S. Hale.

**JAY GOULD MINING COMPANY.**—This company's statement shows about \$5,000 liabilities, and this for current expenses. The capital stock of \$2,000,000, divided into 400,000 shares, at \$5 each, par value, is represented by the mines at Jay Gould, mills and other improvements.

**MADISON COUNTY.**

**GOLCONDA.**—It is reported that this mine at Red Bluff has been sold to Cleveland, O., parties for \$150,000.

**MEAGHER COUNTY.**

**MAGINNIS MINING COMPANY.**—The annual report, filed at Helena, shows that this company, of Malden, has indebtedness amounting to \$202,123.92, being the amount expended for improvements. The capital stock is \$500,000, represented by the Montana and Oro Cache lodes and a mill site in the Warm Springs mining district.

**SILVER BOW COUNTY.**

**ARLINGTON MINING COMPANY.**—The annual statement, filed at Butte, shows that the capital stock of the company is \$200,000; actual amount of cash paid in on the capital stock, \$94,000; amount of stock still in the treasury, \$40,000. The assets of said company consist of the Star West and Montana Boy claims. The company has no indebtedness.

**MAJOR BUDD GOLD AND SILVER MINING COMPANY.**—The annual statement shows that the capital stock of the company is \$5,000,000, all paid in by purchase of mining property and in cash, and that the amount of existing debts is \$5,804.20.

**ORIGINAL BUTTE MINING COMPANY.**—The annual report of the affairs of this company has also been filed. The capital stock of the company is \$5,000,000, none of it having been paid in cash, but in mines and mining property. The assets consist of the Original Butte and Jasper claims, and the indebtedness on August 1st, 1889, was \$78,056.81.

**NEVADA.**

**CENTENNIAL GRAVEL GOLD MINING COMPANY.**—At a special meeting of the board of trustees of this company, held recently in Gold Hill in Storey County, Nev., it was resolved to resume work in the development of the mine, which was suspended some months ago. A new tunnel is to be started at a point not far from the first tunnel run by the company, in which good pay gravel, carrying coarse gold, was developed. It was found to be too high, however, and a heavy stream of water flowing in and from the gravel channel prevented sinking or working down to the bedrock. The new tunnel will be lower down and run in the bedrock beneath the gravel bed or channel. Henry Richards, who superintended the work during the last two or three years, will conduct the resumption of work. An assessment of three cents per share was levied, to square up liabilities and defray future expenses.

**ELKO COUNTY.**

**BELLE ISLE MINING COMPANY.**—At the annual meeting the following officers were elected for the ensuing year: E. Scott, President; F. A. Beglin, Vice-President; J. W. Pew, T. J. Shackelford and H. H. Pitcher, Trustees. J. W. Pew was re-elected Secretary, and his financial statement showed an overdraft of \$823.91. The Bank of California was elected Treasurer and W. C. Price, Superintendent.

**LINCOLN COUNTY.**

**PIOCHE CONSOLIDATED MINING COMPANY.**—This company is pushing developments on most of its claims. On the Raymond & Ely drifts have been extended both ways on the twelfth level. This level is just at water level. Below it a winze has been sunk 280 feet, all the way on the vein, where it is from 15 to 30 feet wide. Above the water level it is good stopping to the surface, says the *San Francisco Report*, the vein above being from seven to ten feet wide. Lately ore has been found above that averages 190 ounces silver clear across the vein. This is zinc blende lead and occasional lumps of steel galena. Lead ore is coming in on the drift being extended on the tenth level. The new 50-ton water-jacket smelter will be started up shortly. Mr. August Werner, of Leadville, is to be the smelter in charge. The 40-ton concentrator is ready to start work.

**STOREY COUNTY COMSTOCK LODE.**

**ANDES MINING COMPANY.**—At a meeting of the directors of this company, held in San Francisco September 30th, the office of the superintendent of the mine was declared vacant. Afterwards Dominick Briden was appointed to fill the position. This action ousts Oscar Steele from the superintendency. Mr. Steele is the principal owner of the West Con. Va. & Cal., adjoining the west boundary line of the Con. Cal. & Va.

**BELCHER MINING COMPANY.**—Preparations are in progress for resuming explorations on the 1,500 level in this mine. The project of draining the water in that mine and the Crown Point down to the 1,500 level is now being discussed, the management having proposed to the companies that will be benefited by it to contribute toward the cost.

**CONSOLIDATED CALIFORNIA AND VIRGINIA MINING COMPANY.**—This company shipped to the Carson Mint October 1st 19 bars of bullion, valued at \$59,582.85, making total shipments for the month of September to date of \$129,675.71, with further shipments to arrive.

**YELLOW JACKET MINING COMPANY.**—On the authority of Superintendent Sharon, there is no suspension of ore shipments from this mine, which average 50 tons daily. The stamps at the Brunswick mill are only temporarily hung up pending the accumulation of ore. It costs no more to crush 100 tons daily at the Brunswick than it does to crush 50 tons; but as the latter is the average number of tons extracted every 24 hours from the Yellow Jacket with the present force employed, the Brunswick mill stamps are usually hung up two weeks in each month to allow the accumulation of sufficient ore to keep the mill crushing 100 tons daily the remainder of the month.

**NEW JERSEY.**

**HUNTERDON COUNTY.**

**WEST END IRON COMPANY.**—The Sheriff of Hunterdon County on the 8th inst. began a five-days' sale of the real and personal property of this company, at West Portal. The company, it is said, has mined and sold over 1,000,000 tons of iron ore during the past ten years. Its liabilities reach \$300,000, against an appraisal of \$30,000 assets.

**NEW MEXICO.**

**GRANT COUNTY.**

**STANDARD MUTUAL MINING COMPANY.**—Our attention has been called to this organization, which has recently opened an office in New York. Inquiry at the company's offices by a representative of the *ENGINEERING AND MINING JOURNAL* elicited the following statement concerning its work and prospects from Mr. W. S. Morrow:

"The company was organized in 1887 with a capital stock of \$10,000,000, shares \$10 each, non-assessible. It was incorporated under the laws of the State of Maryland. The property consists of the Atwood, Henry Clay, Yellow Jacket, Surprise, Polar Star and Ophir claims, of which the first three are patented. On the Atwood and Henry Clay claims 1,500 feet of development work has been done. They are all in the camp of Shakespeare, in Grant County, two and a half miles from the Southern Pacific Railroad, and formerly belonged to the Atwood Mining Company, from whom we purchased them.

"Last June some Oil City people became interested in the Enterprise, and agreed to pay us \$104,000 and to erect a 30-stamp mill complete on the property for 800,000 shares of our capital stock. They commenced work on the mill two months ago. The \$104,000 will pay off the balance due on the purchase of the mines, and therefore when our mill is completed we will not be a dollar in debt. We have no treasury stock. The present board of trustees, elected at the annual meeting last June, is composed as follows: Marcus Hulings and Willis J. Hulings, of Oil City, Pa.; Samuel Davenport, of Erie, Pa.; Wm. A. Scofield, of Carlisle, Pa.; John J. Weed, of Washington, D. C.; Louis Stow, of Baltimore, Md., and Wm. S. Morrow, formerly of Chambersburg, Pa., but now of New York City. The officers are Marcus Hulings, president, and Louis Stow, secretary and treasurer. Mr. Hulings, the president, is also in charge of the property as superintendent. The ore will average \$12 to \$15 per ton on actual mill runs. There are 2,000 tons of it on the dump, and 100,000 tons in sight in the mine. It can be mined and milled for \$2 per ton. The stock of the company will probably be listed on the New York Consolidated Stock and Petroleum Exchange shortly. It will not be sold at less than 50c. a share."

[At this figure a valuation of \$500,000 will be placed on the property. Why not make this the capital stock instead of the inordinately high amount, \$10,000,000? We shall be pleased to hear from our correspondents concerning this enterprise.—*ED. ENGINEERING AND MINING JOURNAL.*]

**HACHITA MINING COMPANY.**—This is a new enterprise, which proposes to work the Nancy mine in this county, said to be 50 miles from Shakespeare and 12 miles from Separ. The company was organized last month under West Virginia laws with a capital stock of \$100,000, issued in one dollar shares. The officers are W. S. Morrow, President; Wm. K. Smith, Vice-President; J. W. Snedeker, Secretary; R. P. Wakeman, Treasurer. These gentlemen, with R. F. Brooke, constitute the Board of Trustees. Mr. W. K. Smith is also Superintendent. A 10-stamp mill has been purchased from an adjoining property, and is now being moved to the Nancy mine. According to Mr. W. S. Morrow, who also furnishes us the above information, there are 20,000 shares of treasury stock, which are being sold at 50c. per share.

**SAN MIGUEL COUNTY.**  
**LINCOLN LUCKY.**—A "strike" is reported on this property, upon which it is said that an option for 90 days has been secured by Las Vegas, N. Mex., and New York parties.

**OREGON.**  
**BAKER COUNTY.**  
[From our Special Correspondent.]  
Mining in the neighborhood of Baker City is unusually active and much attention is being given to the district by the miners of other sections.

**BIG ALECK.**—This mine, owned by a New York company, is generally reported in Baker to be a scheme unworthy of confidence. A Huntington mill was erected and put in operation some weeks ago. So far little results have been obtained.

The ores surrounding Baker City are generally base, the only really free gold ore being the ore at Conner Creek, upon which the Conner Creek Mining Company have been working over 15 years. This ore is entirely different from the ores of the other districts, which have so often proved the cause of failure to mining operators. It is for this reason that the expensive experiment of Mr. Szontagh, at the Eureka and Excelsior, is being watched with so much interest.

**ELKHORN AND BAYSLEY.**—This mine, on Pine Creek, is reported sold to Portland and St. Louis parties, who will erect a gold mill at once. This mine shows some free gold in the works near the surface, where decomposition has taken place, but at a comparatively slight depth the ore will be base and cannot be worked in the mill now talked of.

**HOGEM.**—This mine, at Sanger, is reported to have exhausted its reserves and will close its mill until the new shaft just started opens the mine at a lower level. This property is owned by a Milwaukee company, and has been in constant and successful operation for a number of years.

Matters at Sparta have been very quiet, nothing going on excepting a little placer washing conducted by Chinamen.

**LOUISVILLE MINING COMPANY.**—At Candalaria, 75 miles northeast of Baker, this company, under superintendent Smith, has been running its mill all summer, with encouraging results. Enough free gold is caught on the plates to pay all expenses and the concentrates are saved for profit. It is reported to be the intention of the company to erect chlorination works in the spring to extract the gold by the Plattner process on the ground. The long wagon haul to railroad prevents their shipment. The dump of concentrates is said to contain \$100,000 profit. This camp has been very active during the summer, much prospecting work having been done with good results.

**PENNSYLVANIA.**  
**COAL.**

A dispatch from Osage City, Kansas, says the strike of the coal miners at Serranton was amicably settled on Saturday. The employers granted an advance of 10 cents per ton in mining.

The Delaware & Hudson Canal Company has determined to flood the burning mine at Olyphant, and it is now reported that water is rushing down the shaft at the rate of 13,000 gallons per minute. It is estimated that it will take at least six months to effectually flood No. 2 Colliery and pump the water out again. The mine was the principal industry of the borough of Olyphant. The mine pumps were stopped September 17th. The fire is generating great volumes of smoke, and the fans will be kept running until the water has risen so high that they can no longer be operated.

**OIL.**  
Exports of refined, crude, and naphtha from the following ports, from January 1st to October 5th, were as follows:

|                    | 1889.       | 1888.       |
|--------------------|-------------|-------------|
|                    | Gals.       | Gals.       |
| From Boston.....   | 3,543,901   | 3,383,298   |
| Philadelphia.....  | 117,172,910 | 102,791,515 |
| Baltimore.....     | 5,748,611   | 5,641,387   |
| Perth Amboy.....   | 13,847,575  | 17,182,445  |
| New York.....      | 344,783,643 | 272,656,369 |
| Total exports..... | 485,096,640 | 401,655,014 |

**UTAH.**

**HORN SILVER MINING COMPANY.**—The following directors were elected at the annual meeting held at Frisco on October 1st: A. C. Washington and Theodore B. Moore, of Brooklyn, N. Y.; Bache McE. Whitlock and Andrew R. Culver, of New York City; John Sharp, Jr., and Frank W. Jennings, of Salt Lake City, and P. T. Farnsworth, of Beaver. The directors meet at New York, October 23d, to elect officers, and A. J. Harrison, of that city, is to be the secretary and treasurer. Mr. Farnsworth remains manager as before. The mine, according to local papers, continues to yield at the rate of 1,000 tons per month. The new

shaft, 500 feet north of the present works, is now down 200 feet.

**SUMMIT COUNTY.**  
**ANCHOR MINING COMPANY.**—The project to bore a six-inch drain from the bottom of the Anchor shaft to the tunnel level, a distance of about 600 feet, is a failure, says the Park City Record, so far as the attempts made by the contractors with their light apparatus are concerned. To pump and sink would be very costly, and to upraise from the tunnel level under such an immense pressure of water would be equally as costly, hence the cheapest, safest and most practicable plan is to bore a hole for drainage. This connection must be made, but just how is still undecided by the management. When this connection in the Anchor is made the mine will be "drained and kept so, thus permitting advantageous developments. Then the ore reserves in the upper levels can be worked profitably.

**WOODSIDE MINING COMPANY.**—The announcement is made this week that dividend No. 1 on the capital stock of this company will be paid on the 15th inst. It is of 25 cents a share and aggregates \$25,000. Last June the company was organized with a capital stock of \$1,000,000 in shares of \$10 each par value. Since then the principal work has been to get the mine in shape for profitable production, and also to open up virgin ground. Considerable dead work has had to be done to make good past errors. The new hoisting works will be in shape for work shortly.

**VIRGINIA.**  
**CHESTERFIELD COUNTY.**

**MIDLOTHIAN.**—Philadelphia parties will take 500 tons of coal per day from these coal mines. The company has five veins on the property. Mr. M. B. Williams, General Manager of the Red Ash Coal Company, of Wilkesbarre, Pa., is president, and Mr. John Teasdale, General Manager of the West End Coal Company, of Mocaquana, Pa., is vice-president of the Midlothian Company. The directors are Charles Parrish, S. S. Murphey, C. P. Hunt, M. B. Williams, H. H. Ashley, John Teasdale and E. H. Wilson, all from Pennsylvania.

**FOREIGN MINING NEWS.**

**HONDURAS.**  
**CHAMELICON GOLD MINING COMPANY, LIMITED.**—This company has been registered by Armstrong & Lamb, 33 Old Jewry, E. C., with a capital of £150,000 in £1 shares. Object, to acquire, under an agreement dated September 16th, made between Colley & Co. and E. A. Reeves (as trustee for the company), a concession from the Government of Honduras of certain mining rights at or near the River Chamelicon, Honduras, and certain machinery and things described in such agreement; to explore, work, develop and maintain the mines and mining rights to be obtained by the company.

**MEETINGS.**

Justice Mining Company, Aspen, Colo., October 15th, at 2 P. M.

New England Gold and Silver Mining Company, 115 Broadway, New York, October 18th, at 12 o'clock, noon. Transfer books close October 1st and reopen October 19th.

St. Lawrence Marble Company, 455 Broadway, New York, October 29th, at 12 o'clock, noon.

Willion Creek Gold and Silver and Milling Company, 145 Broadway, New York, October 14th, at 1 P. M.

**ASSESSMENTS.**

| COMPANY.                           | No. | When levied. | D'ty'nt in office. | Day of Sale. | Ann't per share. |
|------------------------------------|-----|--------------|--------------------|--------------|------------------|
| Alliance, Utah.....                | 44  | Sept. 11     | Oct. 15            | Nov. 5       | .10              |
| American Gulch, Mont.....          |     | Aug. 31      | Oct. 12            | Nov. 30      | .02              |
| Apex, Utah.....                    |     | Sept. 16     | Oct. 21            | Nov. 11      | .05              |
| Balt. & Vict., Utah.....           |     | Sept. 5      | Oct. 9             | Oct. 29      | .02              |
| Best & Belcher, Cal.....           | 44  | Sept. 11     | Oct. 16            | Nov. 6       | .25              |
| Chicago Mill. & Mfg. Co., Cal..... |     | 2 Sept. 13   | Oct. 18            | Nov. 4       | .15              |
| Crown Point, Cal.....              | 52  | Sept. 18     | Oct. 21            | Nov. 11      | .50              |
| Del Norte, Cal.....                |     | 2 Aug. 24    | Oct. 3             | Oct. 26      | .07½             |
| Double Stanard, Dak.....           |     | 3 Aug. 29    | Oct. 2             | Oct. 18      | .00½             |
| Florence, Dak.....                 |     | 4 Sept. 21   | Oct. 21            | Nov. 5       | .002½            |
| Grey Eagle, Dak.....               |     | 2 Sept. 10   | Nov. 9             | Nov. 30      | .00½             |
| Golden Prize, Cal.....             |     | 3 Sept. 21   | Oct. 26            | Nov. 16      | .25              |
| Hartery Cons., Cal.....            |     | 1 Sept. 17   | Oct. 19            | Nov. 5       | .05              |
| Hartford, Dak.....                 |     | 1 Sept. 26   | Oct. 30            | Nov. 16      | .001             |
| Keyes, Nev.....                    |     | 4 Aug. 27    | Oct. 1             | Oct. 21      | .30              |
| Livermore, Cal.....                |     | 1 Sept. 18   | Oct. 19            | Nov. 6       | .50              |
| Lockport, Dak.....                 |     | 4 Sept. 27   | Oct. 26            | Nov. 12      | .002             |
| New La Plata, Dak.....             |     | 3 Sept. 19   | Oct. 21            | Nov. 5       | .001             |
| North Belle Isle.....              | 16  | Sept. 18     | Oct. 22            | Nov. 13      | .20              |
| N. Bonanza.....                    | 9   | Sept. 17     | Oct. 18            | Nov. 14      | .10              |
| Peer, Ariz.....                    | 8   | Sept. 4      | Oct. 10            | Nov. 5       | .10              |
| Potosi, Cal.....                   | 33  | Sept. 18     | Oct. 22            | Nov. 12      | .50              |
| Scott Bar, Cal.....                | 3   | Sept. 10     | Oct. 12            | Oct. 31      | .10              |
| Silver Hill.....                   | 25  | Sept. 27     | Oct. 31            | Nov. 21      | .20              |
| Union, Utah.....                   |     | Sept. 6      | Oct. 10            | Oct. 30      | .00½             |
| W. Y. O. D., Cal.....              | 4   | Sept. 17     | Oct. 19            | Nov. 4       | .20              |

\* Delinquency and day of sale postponed to dates given above.

**DIVIDENDS.**

Aluminium Company, Limited, semi-annual dividend of five per cent., or seventy-five cents per share, payable September 30th, at No. 115 Cannon street, E. C. London, England.

Boston & Montana Consolidated C. & S. Mining Company, dividend No. 5, of one dollar per share, or \$100,000, payable November 20th, to stockholders on record October 15th.

Caledonia Gold Mining Company, dividend No. 16, of eight cents per share (or \$8,000), payable at the office of Laidlaw & Co., 14 Wall street, New York, on October 26th. Transfer-books close in New York, October 24th.

Calliope Mining Company, of Colorado, paid October 10th dividend No. 3, of one per cent. a share, or \$10,000.

Montana Limited Mining Company, of Montana, dividend No. 18, of twelve and one-half cents a share, or \$82,500, payable in London, England, on October 15th.

National Gas Improvement Company, 115 Broadway, paid the quarterly dividend of one and one-quarter per cent. October 10th.

New Guston Mining Company, of Colorado, paid October 1st dividend No. 4, of fifty cents a share, or \$50,000.

Philadelphia Gas Company, of Pittsburg, quarterly dividend of two per cent., payable October 25th.

Thomson-Houston International Electric Company, dividend of three and a half per cent. per share on the preferred stock, payable October 10th.

United Gas Improvement Company, Drexel Building, Philadelphia, Pa., dividend of four per cent. per share, payable October 15th.

Woodside Mining Company, dividend No. 1, of 25 cents per share, or \$25,000, payable October 15th.

**MINING STOCKS.**

[For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, St. Louis, Pittsburg, Birmingham, Ala.; London and Paris, see pages 330 and 332.]

**New York.**

FRIDAY EVENING, Oct. 11.

Very little life has been apparent in the market this week. Values, with one or two exceptions, show a weakening tendency and the transactions are confined to very few traders.

The Comstocks, which in times past have been considered the real backbone of the market, are dull and weak, a condition which only reflects the state of affairs in the San Francisco market. Consolidated California & Virginia has declined to \$6, said to be the lowest quotation made for this stock since the discovery of the new ore body in the mine in 1886. Traders are hoping that history will repeat itself in this matter. A bonanza "strike" in this or any other mine on the lode would work wonders in the share market. No dividend will be paid this month, the product for September being insufficient to yield the necessary surplus. It is noteworthy that the grade of the ore within the last few months has declined from \$30 to \$27 per ton, a serious falling off in these days of small profits. The present prospects of the other Comstock mines do not justify any immediate rise in stocks; but the outlook for a steady season's work for the miners is good. It is now reported that J. W. Mackey will not return to the Coast before November 1st.

This week Consolidated California & Virginia fluctuated from \$6.75 to \$5.63, closing weak. Belcher sold at \$2.55; Chollar, \$1.65; Hale & Norcross, \$2.90; Oquir, \$4.60; Sierra Nevada, \$2.40@2.45; Yellow Jacket, \$3; Alta, 2 10@2.40, with an advancing tendency. Bullion, 80@60c., Exchange, 75@65c., Julia, 30c., Mexican, \$3 80@3 75, Occidental, \$1.40@1.45, Potosi, \$1 35@1.40. Union Consolidated \$3; Utah, \$1@1.10.

Sutro Tunnel, old stock, sold at 6@8c. and the Trust certificates at 60c. As we have from time to time recorded, there have been numerous rumors afloat that trouble has been brewing for the gentlemen in charge of the reorganization of the Sutro Tunnel. These rumors have heretofore been vague and unreliable, but the matter will now probably be brought to a crisis shortly, as will be seen from the following press dispatch, dated San Francisco, October 10th: "Notice was filed in the Superior Court to-day, warning all Comstock mining corporations against paying royalties or money due the Sutro Tunnel Company to the Union Trust Company, of New York, or the Comstock Tunnel Company, of New York. They are requested to make all payments to the treasurer of the Sutro Tunnel Company. Notice is also given of a suit to be begun against Theodore Sutro, the president of the tunnel company, the two New York companies named and others for conspiracy to defraud the stockholders of the Sutro Tunnel Company by pretended sale of properties, franchise and contracts under a decree of foreclosure of mortgages, whereas, in fact, the mortgages had been settled by the Sutro Tunnel Company. The notice is signed by Frank J. Symmes for himself and as agent for Joseph Aron, and F. N. Wheelan. Its immediate effect will be to stop the payment of \$20,000 in royalties by the Comstock companies, which otherwise would have been made to-day. In speaking of the suit Mr. Symmes was very bitter in his criticism of the methods of Theodore Sutro. He claimed that the New York syndicate had received in royalties many times the money it advanced. The object of the suit, he said, is to secure our interest in \$565,000 of bonds now about to be diverted to the use of this New York syndicate, and to get \$500,000 worth of the stock of the Sutro Tunnel Company, now practically confiscated or to be diverted to the Comstock Tunnel Company or other corporations with Theodore Sutro at their head. Also to prevent the payment of a \$100,000 fee to Theodore Sutro for services, for which he has already been amply paid, and of \$50,000 to Seligman and others. We



will endeavor, he says, to obtain an accounting from the Union Trust Company and the Comstock Tunnel Company. The latter corporation was formed a few weeks ago by New York capitalists. We charge that Sutro is playing into its hands."

Last March, as readers of the **ENGINEERING AND MINING JOURNAL** will remember, Mr. Joseph Aron, who is evidently the instigator of the above proceedings, unsuccessfully made similar charges through the columns of a daily paper of this city, to which we referred in our issue of March 2d.

The advance in Eureka Cons., both in San Francisco and New York, has been one of the features of the week. It has been due principally to the limited amount of stock obtainable. A moderate inquiry for shares this week quickly advanced quotations to \$5.50. Latterly, the price declined to \$4.40, but advanced again to-day.

There has been more activity in the Tuscarora shares. Belle Isle sold once at 15c., Grand Prize at 90c., North Belle Isle at 65@80c. Navajo at 35c. Barcelona sold to day at 30c.

Conspicuous among the Bodie shares is Bodie Consolidated, which has risen to 75@85c. The movement in this stock is simply the result of manipulation from San Francisco, the abiding place of the present peculiar management of the company.

Bulwer sold at 25c. Astoria, with unflinching regularity, changes hands, or is reported to do so, at 20c.

Brunswick is quoted at 3c. As noted in this column some weeks ago, there has been a suspicion on 'Change that the recent activity in this stock has been caused by heavy sales of the treasury stock by the management of the company, but President Henry B. Murray informs us that there is no foundation for any such belief; that the 80,000 shares in the treasury at the time of his official report to the Consolidated Exchange in August have been preserved intact; and, finally, that negotiations looking to a resumption of work at the mine are in progress. Inasmuch as the way to make a market for treasury stock is not to flood the Exchange with it, we are inclined to believe Mr. Murray's statement.

Quicksilver preferred was traded in at \$35. Sales of Plymouth are reported at \$3. In our mining news columns we publish an official statement from the management of the company.

Stanislaus sold at \$1.30.

The feature of the trading in Colorado stocks has been the drop and continued decline in Ward Consolidated, which sold on Monday at 65@75c. and yesterday at 55@40c. The "insiders" have evidently withdrawn their support from the stock, and well-informed traders predict that it will never regain its former quotations, all of which of course is more or less speculative. Little Chief sold at 36@38c., Plutus at 76@70c., Iron Silver at \$240, Lacrosse at 5c., and Small Hopes at \$1.10.

The Dakota shares this week, as well as last, have furnished the most interesting portions of the transactions. Caledonia on Saturday last was forced down to \$2, but since then has steadily recovered, selling at \$2.75 yesterday.

There are many conflicting rumors concerning the condition of the property. The usual monthly dividend, No. 16, of eight cents per share will be paid on the 26th instant. Deadwood Terra, in the early part of the week, declined to \$1.25, but recovered latterly to \$1.50, its former quotation. Homestake was also weaker, selling at \$9.50@9. The annual report of the company and our remarks thereon are published elsewhere. No sales of Iron Hill were made.

Father de Smet shares have been rather pressed on the market this week, selling at 19@25c. Messrs. Laidlaw & Co. are the New York transfer agents of the company. We understand that no work has been done by the Father de Smet Company for a period of about two years, the ore remaining in the mine being of so low a grade as to render its working unprofitable.

The 100-stamp mill of the company, since work was suspended in the mine, has been used by the Deadwood-Terra Mining Company, it is said, without compensation to the De Smet Company. Mr. J. B. Haggin, it will be remembered, is the moving spirit of both enterprises. It is now said that the Deadwood-Terra Company is about to make a settlement of some kind which will materially deplete its treasury, and correspondingly enrich the Father de Smet organization. If this is so, it is pertinently asked, "Why is the stock of the latter company pressed for sale?"

St. Joseph Lead Company stock is quoted at \$14.50 bid, \$15 asked.

Horn Silver is quiet at \$1.30. A report of the annual stockholders' meeting at Salt Lake City last week will be found in our news columns. Ontario is quoted at \$35.

Phoenix, of Arizona, has fluctuated from 50 to 60c., closing to-day at 51@56c., with total sales for the week of 3,700 shares. The decreased activity in the stock is regarded as a good sign by those who are opposed to any manipulation of the shares, and there is an inclination to give the new management of the company a fair chance.

As announced in the **ENGINEERING AND MINING JOURNAL** last week, the annual meeting of the stockholders of the Phoenix Mining Company was held at No. 35 Pine street yesterday afternoon. About 275,000 shares were represented. Mr. Henry E. Wallace was elected chairman and Mr. H. G. Romaine secretary of the meeting. The report of the committee of the stockholders appointed at the meeting of the shareholders last December, as noted in the **ENGINEERING AND MINING JOURNAL** before, was

then read. In substance, it stated that their first act was to secure the services of Mr. W. F. Lunt, of Portland, Oregon, as counsel for the company in Arizona. Mr. Lunt found, on going to Arizona, that judgments amounting to \$20,000 were held against the company by the Hartford Banking Company, of Phoenix, to whom they had been assigned. Mr. Lunt, at the direction of the committee, secured a compromise of these claims for \$12,000, which was borrowed by the committee on the assurance that the company would secure the same by a mortgage. Consents to this mortgage have been obtained, the report further states, from two-thirds of the stockholders. It is also stated that Mr. S. W. Curtis some time ago resigned from the committee, and his place has been filled by Mr. George F. Chamberlan, who has acted as counsel for the company in New York since last December. The amount realized from the subscriptions of 5c. per share asked for at the stockholders' meeting last December was \$764,255. The expenses of the committee were \$820, and their counsel fees \$1,585.

It was then regularly moved, seconded and carried that the committee be discharged from its labors, and that as soon as the funds of the company would permit they be reimbursed for whatever outlay had been occasioned.

Mr. Charles I. Hardy, the president of the company, then read the annual report. He stated that the present board of trustees had been in office for only one month. The first action of the new board of trustees, Mr. Hardy said, was to remove Mr. R. B. Todd, the former legal agent and superintendent of the company in Arizona, and to appoint Mr. W. B. Gillingham in his place. Mr. Hardy further stated that directions had been sent to Arizona for the commencement of work forthwith. The property consists of two mining claims, with mill claims and a 20-stamp mill in Maricopa County, Ariz. The ore, it is stated, will yield from \$3 to \$8 per ton. It may be necessary to increase the stamp power, said Mr. Hardy, which will be done from the sale of treasury stock amounting to 63,400 shares, now in the hands of the trustees, as soon as the credit of the company is re-established. The money needed immediately to resume work has been borrowed to the extent of \$845,455.

In explanation of Mr. Hardy's statement that the officers of the company had been in office but one month, we are informed that at a meeting held on August 28th last the following gentlemen, constituting the old board of trustees, resigned: Geo. L. Strong, Edward M. Butler, James W. Fox, I. M. Taylor and H. A. Alexander. Mr. Strong was president of the company and Mr. Butler, secretary.

After the reading of Mr. Hardy's report, a resolution was adopted authorizing the president to execute a mortgage of \$12,000, due in three years, with interest at 6 per cent. per annum, payable semi-annually, and redeemable at any time at the option of the company.

A resolution was then adopted empowering the board of trustees to make any necessary additions to the stamp power of the company whenever necessary, provided that the expenditure does not exceed the amount of cash on hand in the company's treasury. The election of trustees for the ensuing year was then declared to be in order. After a recess of twenty minutes for the purpose of voting, the tellers, Messrs. Tison and Prince, reported that by a vote of 262,790 shares the following board of trustees was elected: Geo. F. Chamberlan, S. W. Curtis, Charles I. Hardy, H. G. Romaine, E. G. Wallace.

We understand that this is actually the first meeting ever held by this company; a fact which, incredible as it may seem, is illustrative of the methods of the former management of the company, of which Mr. James M. Seymour was the head.

Several sales of Silver King were made at from 57@60c.

Silver Mining, of Lake Valley, changed hands at 35@30c.

Alice, of Montana, sold at 90c.

El Cristo has been weaker at 85c.

Mutual Mining and Smelting has shown increased activity at \$1.45@1.50.

Rappahannock is quiet at \*06c.

United Copper sold at \$1.10@1.15.

**Boston.**

Oct. 10.

[From our Special Correspondent.]

There is rather a better feeling regarding copper stocks, owing to the firmness of the companies in holding ingot at 11c. per pound, and although the market is dull, there are not many stocks offering, and any attempt to buy in large lots would doubtless advance prices considerably above the present quotations. There is no question but that some of the stocks are selling much below their true value, and it only needs a little confidence in the future to start a pretty lively boom all along the line. The market was strengthened to-day by the announcement of a dividend of \$1 per share on Boston & Montana, which advanced the stock from \$33½@33¾, at which it had been selling all the week, to \$35½.

Calumet & Hecla was also better. After selling at \$215 early in the week it declined to \$211, and recovered again to-day to \$215.

Tamarack holds very steady at \$105, and Quincy at \$50@50½.

Osceola sold at \$10@10½, declining again to \$10.

Atlantic advanced ¼ to \$8, and Franklin sold up to \$9½, closing at \$9.

Pewabic sold at \$3, as before, and is wanted at that price.

Santa Fe declined to 35c., the lowest yet, but quickly rallied to 42¼c., with a small sale at 50c.

Bonanza declined to 50c. for 200 shares. Nothing doing in balance of the list.

The silver stocks continue dull. Dunkin sold at 85c., ex-dividend. A 500-share certificate sold at 77½c., the books being closed so that it could not be broken up. Closing sales at 80c. Napa Quicksilver sold at \$4.

Market closed steady.

**San Francisco.**

The following, from the San Francisco *Evening Post*, is worthy of the careful attention of all those interested in a revival of activity in mining share speculation: "It looks now as if the days of the exchange here were about numbered. Its membership has been degenerating for years past, and now the few who remain that possess money and enterprise are in a hopeless minority. Instead of using every endeavor to build up public confidence in the business nothing has been left undone to wreck it. Wildcat shares have been supported with a loyalty which could have been exhibited to better advantage in the protection of clients. \* \* \* The San Francisco Stock Exchange, as its runs to-day, does not even compare favorably with the little California Board which faded out of existence some years ago. The Pacific Board shows more enterprise and transacts a much larger business, if the daily returns of both sessions were taken into account.

**St. Louis.**

The Poorman Mining Company, of Burke, Shoshone County, Idaho, has been listed on the St. Louis Mining Exchange.

**Electric Stocks.**

A circular to Thomson-Houston Electric Company stockholders states that the capital stock was increased at a special meeting on October 5th, and the 60,000 new shares are offered to stockholders of record October 10th, one new share for each two then held, payment to be made by cash payment of \$12.50 per share October 16th, and three months' note for \$12.50 per share, payable January 16th, 1890, stock to be delivered when the second payment is made. The rights are assignable. Another circular announces that by vote of the directors a dividend has been declared payable to the holders of common stock of record October 5th by a distribution among them of certificates representing undivided interests in certain assets taken from the surplus net earnings of the company. These assets, comprised in what will be known as "Thomson-Houston trust securities—series D," have been set apart in the hands of three trustees to be disposed of from time to time for the benefit of the holders of said certificates. Accompanying is a certificate representing the number of shares in said trust to which each stockholder is entitled.

**PIPE LINE CERTIFICATES.**

(Special Report by Messrs. WATSON & GIBSON.)

There was a decrease in September of 886,000 barrels in gross stocks, from which a deduction should be made of 143,140 barrels decrease in the surplus account which made a net reduction in merchantable oil for the month of 743,000 barrels. These figures were bullish, of course, but no more so than previously expected, and they failed to arouse the market from its extreme lethargy.

There is no speculation in petroleum at present, and as long as the Standard Oil Trust show no disposition to excite it, and as long as Ohio oil at its present low prices remains an uncertain factor, just so long we may expect the present stagnation to continue.

**NEW YORK STOCK EXCHANGE.**

|             | Opening. | Highest. | Lowest. | Closing. | Sales.  |
|-------------|----------|----------|---------|----------|---------|
| Oct. 5..... | 98½      | 98½      | 98½     | 98½      | 54,000  |
| 7.....      | 98¾      | 98¾      | 98½     | 98¾      | 91,000  |
| 8.....      | 98½      | 98½      | 98½     | 98½      | 129,000 |
| 9.....      | 98½      | 98¾      | 98½     | 98½      | 126,000 |
| 10.....     | 98½      | 98¾      | 98½     | 98½      | 125,000 |
| 11.....     | 98½      | 98½      | 98½     | 98½      | 134,000 |

Total sales in barrels..... 568,000

**CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.**

|             | Opening. | Highest. | Lowest. | Closing. | Sales.  |
|-------------|----------|----------|---------|----------|---------|
| Oct. 5..... | 98¾      | 99¼      | 98¾     | 99       | 71,000  |
| 7.....      | 99½      | 99½      | 98¾     | 99       | 182,000 |
| 8.....      | 99       | 99½      | 98¾     | 98¾      | 313,000 |
| 9.....      | 99½      | 99½      | 99½     | 98¾      | 219,000 |
| 10.....     | 99       | 99       | 98¾     | 98¾      | 225,000 |
| 11.....     | 99       | 99½      | 98¾     | 99       | 124,000 |

Total sales in barrels..... 1,135,000

**COAL TRADE REVIEW.**

NEW YORK, Friday Evening, Oct. 11.

**Statistics.**

PRODUCTION OF ANTHRACITE COAL for week ended October 5th and year from January 1st.

|                         | 1889.   | 1888.     |
|-------------------------|---------|-----------|
| Tons of 2,240 lbs.      | Week.   | Year.     |
| P. & Read R.R. Co.....  | 186,148 | 5,356,976 |
| Cent. R.R. of N. J..... | 150,403 | 4,480,521 |
| L. V. R.R. Co.....      | 164,500 | 5,655,838 |
| D. L. & W. R.R. Co..... | 115,275 | 3,885,240 |
| D. & H. Canal Co.....   | 72,999  | 2,890,400 |
| Penna. R.R.....         | 64,861  | 2,446,967 |
| Penna. Coal Co.....     | 30,699  | 987,127   |
| N. Y., L. E. & W.....   | 14,560  | 830,828   |

Total..... 799,835 26,533,917 28,313,258

Decrease..... 1,779,341

The above table does not include the amount of coal

consumed and sold at the mines, which is about six per cent. of the whole production.

These figures are subject to corrections for duplications.

Production for corresponding period :

|           |            |           |            |
|-----------|------------|-----------|------------|
| 1884..... | 23,288,227 | 1886..... | 23,630,201 |
| 1885..... | 22,890,615 | 1887..... | 25,853,161 |

PRODUCTION OF BITUMINOUS COAL for week ended October 5th, and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

| Tons of 2,240 lbs.       | Week.   | 1889.     | Year.     | 1888. | Year. |
|--------------------------|---------|-----------|-----------|-------|-------|
| Phila. & Erie R.R.....   | 3,263   | 59,105    | 48,146    |       |       |
| Cumberland, Md.....      | 54,890  | 2,315,348 | 2,727,076 |       |       |
| Barclay, Pa.....         | 3,100   | 87,489    | 119,820   |       |       |
| Broad Top, Pa.....       | 7,123   | 247,205   | 266,522   |       |       |
| Clearfield, Pa.....      | 55,112  | 118,718   | 2,565,364 |       |       |
| Allegheny, Pa.....       | 17,838  | 604,388   | 595,076   |       |       |
| Beach Creek, Pa.....     | 33,921  | 1,145,298 | 1,154,526 |       |       |
| Pocahontas Flat Top..... | 34,879  | 1,293,474 | 1,056,152 |       |       |
| Kanawha, W. Va.....      | 39,500  | 1,381,780 | 1,220,112 |       |       |
| Total.....               | 249,626 | 7,252,814 | 9,752,254 |       |       |

WESTERN SHIPMENTS.

|                       |        |           |           |
|-----------------------|--------|-----------|-----------|
| Pittsburg, Pa.....    | 16,777 | 484,169   | 543,917   |
| Westmoreland, Pa..... | 37,098 | 1,121,612 | 1,166,623 |
| Monongahela, Pa.....  | 8,075  | 304,515   | 306,302   |
| Total.....            | 61,950 | 1,910,296 | 2,016,842 |

Grand total..... 311,576 9,163,110 11,769,096

PRODUCTION OF COKE on line of Pennsylvania R. R. for week ending October 5th, and year from January 1st, in tons of 2,000 lbs.: Week, 94,080 tons; year, 3,297,957 tons; to corresponding date in 1888, 3,055,260.

**Anthracite.**

There has been a much freer movement of coal this week than last, but it must be admitted that a great part of this has been on old orders, and was moved under threat of cancellation of contract. There is, however, a better feeling generally apparent. Cars are scarce, but this is largely attributable to the fact that cars are standing all along the line loaded with coal. During a period when restriction of production is a matter of vital interest to the trade, it is interesting to note the relative tonnages of the several producing companies. For the week ending Saturday last, according to the most reliable statistics that are attainable, Philadelphia & Reading Railroad has shipped about 240,000 tons more than last year; the Lehigh Valley, 600,000 tons more; the Delaware, Lackawanna & Western Railroad, 1,200,000 tons less; the Delaware & Hudson Canal, 500,000 tons less; the Pennsylvania Railway, 900,000 tons less; Pennsylvania Coal Company, 300,000 tons less. An analysis of the above figures can be taken to illustrate the policy of several managers during such a period as this, when sacrifices on all sides have been necessary. Prices may be quoted: Stove, \$4.25; chestnut, \$3.85; egg, \$3.90; pea, \$2.50.

**Bituminous.**

The market for soft coal continues to be greatly hampered for the scarcity of cars. The productive capacity of the mines has been in no way lessened, but on account of the difficulty of securing suitable transportation facilities, sellers have not been able to deliver all the coal ordered. Members of the trade are naturally inclined to think that the railroads have not been treating them fairly. It is said that the scarcity of cars can be principally attributed to their use for storing anthracite. The condition of the anthracite trade should not be allowed to hamper the operations of the soft-coal producers and sellers. Vessel freights during the week have been a little more plentiful than at the time of our last report; but at some ports they are still rather scarce. It is a curious anomaly that coal can be carried to Boston and the Sound ports as cheaply from Philadelphia as from Baltimore, notwithstanding the greater distance of the latter place, an unusual occurrence which has elicited comment. There is some talk of endeavoring to revive the "iron clad" scheme of last spring, the farcical effects of which will be remembered by the readers of the ENGINEERING AND MINING JOURNAL. Notice was received in town to-day requesting the attendance of bituminous producers at a meeting of the Sea Board Association, to be held in Philadelphia during the latter part of the month. Those who have had a long and exceedingly unpleasant experience with this combination under its present management, and whose businesses have suffered on account of their fidelity to the terms mutually agreed upon, are disposed to attach little importance to this new effort to secure uniformity of action. Prices may be quoted \$2.60 f.o.b. Philadelphia and Baltimore, \$3.20@3.25 f.o.b. New York.

**Boston.** Oct. 10.

[From our Special Correspondent.]

Matters are looking considerably better here. Retailers are at last doing a fair fall business, and as will be seen below, retail prices have been advanced. It did seem as if business would never start up, but it has started at last. Jobbers report good inquiry and fair sales, though nothing large. Every one is more hopeful. Stocks on hand are small, and in a good many cases in the aggregate unshipped orders have been canceled. The companies are well supplied with hard coal, and most of the agents here are prepared to fill orders for free burning. The demand for stove coal for the past ten days has reduced the stock of free burning stove considerably.

The Phila. & Reading is still reported as short. There is coal enough, however, as every one knows. Prices f.o.b. at shipping ports are a little firmer, but it is still easy, in nearly all cases, to get in orders at less than circular rates. Individual operators are not forcing the market here, and are obtaining good prices for their coal. The slowness with which coal comes forward is aggravating to many, and might make some trouble if an early cold snap came on right away and lasted for any length of time.

Bituminous coal is without important movement; f.o.b. prices are firm, at \$2.50; Cumberland, for immediate shipment, would command \$2.60. Contracts are being filled slowly, but as water-power has been abundant this season in most localities, owing to frequent rains, no especial trouble is reported from lack of coal. Shippers have, however, rarely if ever had a reason when they were so greatly troubled to get their coal forward without running freights way up and keeping them up. They view the marked activity in building coastwise vessels with complacency, and confidently expect better things next year. New York freights are 95c. @ \$1; Philadelphia, \$1.15 @ \$1.20; Baltimore, \$1.20 @ \$1.30. Arrival of any fleet would be apt to cut these rates down somewhat.

The retailers have at last been able to agree upon an advance. The combination prices have remained unchanged since March, although some attempt has been made to put up prices as wholesale rates were advanced, but conservatism prevailed. Now all agree on a small advance. Rates are for 2,000 pounds, delivered: free-burning stove and nut, \$6.25; egg, \$6; broken, \$5.75; hard Lehigh, broken, \$6; egg, \$6.25; Franklin, all sizes, \$7.50; Cumberland, at wharf, \$4.25. These rates will probably be maintained.

Receipts for the week have been 38,623 tons anthracite and 24,257 tons bituminous, as compared with 59,595 tons anthracite and 24,338 tons bituminous for the same week of 1888. Since January 1st receipts have been 1,228,022 tons anthracite and 712,125 tons bituminous.

**Buffalo.** Oct. 10.

[From our Special Correspondent.]

There is nothing new in the business situation of coal, either in anthracite or bituminous. No change in quotations, supply or demand.

Bids were opened last Monday for the supply of gas and electric light for our city use for the current year commencing October 1st. There was a decline of 5c. per 1,000 cubic feet for gas and 2½c. for each electric light per night, the prices being respectively \$1.25 for gas and 42½c. for electric light. The power of the former to be 18 candles and of the latter 2,000 candles.

The three gas companies united in one bid; the three electric companies sent uniform bids. There is much dissatisfaction expressed at the figures named, and the matter was referred to the Lamp committee.

Lehigh Valley Coal Company officials were in Chicago last week looking up dock property. Presumed that they want facilities for handling coal and other freight.

An interesting topic of discussion among coal men nowadays is the Langdon suit against the New York, Lake Erie & Western Railroad Company.

The Buffalo Natural Gas Fuel Company has duplicated its pipeline in the eastern part of this city to facilitate distribution.

Coal freights by lake steady. Tonnage offered light, except to Chicago and Milwaukee. Severe storms latter part of last week; snow Saturday and Sunday. No vessels laden with coal reported lost, however. The shipments of coal by lake from October 3d to 9th, both days inclusive, 59,015 net tons, namely 32,590 to Chicago, 13,100 to Milwaukee, 4,000 to Duluth, 2,410 to Toledo, 1,800 to Gladstone, 2,000 to Superior, 1,100 to Marquette, 300 to Saginaw, 250 to Marine City, 150 to Port Huron, 1,300 to Fort William; total for season to date 1,666,225 net tons.

The rates of freight were 50c. to Chicago and Fort William, 45c. to Milwaukee, 30c. to Duluth, on contract to Superior and Gladstone, 20c. to Washburne, 25c. to Toledo, 55c. to St. Clair, 40c. to Marine City, Saginaw and Port Huron and 45c. to Marquette.

Receipts by canal first week in October, 1,925 net tons; shipments, 1,065 net tons.

Canal engagements were as follows: Five loads of coal screenings to Syracuse at 75c. per gross ton, free off.

**Philadelphia.**

The Philadelphia Ledger has the following: "The Philadelphia Coal Miners and Shippers' Exchange was organized on Wednesday by the election of the following permanent officers: Thomas W. Ayres, President; William F. Moodie, Vice-President; W. D. Mason, Secretary, and W. Durrell Shuster, Treasurer. The object of the Exchange is to promote the mutual interests of the producing, shipping and wholesale selling interests, and to correct existing abuses in the present method of doing business and to sustain responsible and legitimate retail dealers.

**Pittsburg.** Oct. 10.

[From our Special Correspondent.]

Coal.—The market has ruled firm during the week, with an increased demand. Coal in the lower markets is reported scarce, prices steadily advancing, while there has been no advance here. One may be announced at any time. There is a general complaint of insufficient supply of gas. Many of the manufacturers have been compelled to shut down; others have

returned to coal. A number of miners are at work in the pools. Prices range from 2c. to 2½c. for mining. The nominal rates are:

PRICE OF COAL PER 100 BUSHELS = 7,600 LBS.

|                  |        |                    |           |
|------------------|--------|--------------------|-----------|
| First pool.....  | \$4.75 | Fourth pool.....   | \$3.25    |
| Second pool..... | 4.50   | Railroad coal..... | 5.00@6.00 |
| Third pool.....  | 3.90   |                    |           |

Connellsville Coke.—The situation varies but little from last week, demand active, market firm and cars very scarce. The H. C. Freck Coke Company are still purchasing coal plants and coal lands. It looks as if they would eventually own the entire region. The present month's rates are: F. O. B. Furnace, \$1.50; dealers, \$1.65; foundries, \$1.80; crushed, \$2.30. 'Freights from ovens to Pittsburg 70c. per ton; to Mahony and Shenango Valleys, \$1.35; St. Louis, \$3.65; Cleveland, \$1.70; to Chicago, \$2.75.

**FREIGHTS.**

From Baltimore to: Bath, Me., 1.20@1.25; Boston, Mass., 1.20; Bridgeport, 1.10; Brooklyn, 1.00; Charleston, 75c.@80; Fall River, 1.15; Galveston, 3.00; New Bedford, 1.10; New Haven, 1.10; New London, 1.10; New York, N. Y., 1.00; Portland, 1.20; Portsmouth, 1.25; Providence, 1.10; Richmond, Va., 70; Salem, Mass., 1.20 Savannah, 1.00; Somerset, 1.10; Williamsburgh, N. Y., 1.00.

From Philadelphia to: Alexandria, 85¢; Baltimore, 60¢; Boston, Mass., 1.25@1.35; Charleston, 80¢; Fall River, 80¢@90¢; Galveston, 3.50; Georgetown, D. C., 85¢; Gloucester, 1.35; Lynn, 1.25@1.40; Milton, \$1.40; New Bedford, 80¢@90¢; New York, 90¢; Norfolk, Va., 80¢; Portsmouth, Va., 80¢; Portsmouth, N. H., 1.35; Providence, 80¢@90¢; Richmond, 95¢; Salem, 1.35; Savannah, 1.10; Washington, 85¢.

From New York to: Bath, Me., 90¢; Boston, Mass., 75¢; Charlestown, 75¢; East Boston, 75¢; Lynn, 1.00; New Haven, 60¢; Portland, 75¢; Portsmouth, N. H., 85¢; Quincy Point, 75¢; Salem, Mass., 75¢; Sanguis, 80¢.

\* And discharging. † Alongside. ‡ And towage.

**METAL MARKET.**

New York, Friday Evening, October 11.

Prices of silver per ounce troy.

| Oct. | Sterling Exch'ge. | London Pence. | N. Y. Cts. | Oct. | Sterling Exch'ge. | London Pence. | N. Y. Cts. |
|------|-------------------|---------------|------------|------|-------------------|---------------|------------|
| 5    | 4.86½             | *             | 93         | 9    | 4.86              | 42¾           | 93         |
| 7    | 4.86              | †             | 10         | 10   | 4.86½             | 42¾           | 93½        |
| 8    | 4.85¾             | ‡             | 93         | 11   | 4.86½             | 42¾           | 93½        |

\* 42 11-16. † 42 11-16 to 42¾. ‡ 92½ to 93.

Council bills advanced 7½d. on this week's allotment. Silver market has been characterized by steadiness and good demand for London market. Demoralization in Exchange has been the one factor against higher prices for silver.

United States Assay Office at New York reports total receipts of silver for the week 105,000 ounces.

**Foreign Bank Statements.**

The governors of the Bank of England at their weekly meeting made no change in its minimum rate for discount, and it remains at 5 per cent. During the week the bank lost £223,000 sterling bullion, and the proportion of its reserves to its liabilities was raised from 33-30 to 33-70 per cent., against an advance from 33-78 to 34-26 per cent. in the same week of last year, when its rate of discount was 5 per cent. Thursday the bank lost £143,000 bullion on balance. The weekly statement of the Bank of France shows a decrease of 21,000,000 francs gold and 5,875,000 francs silver. The statement of the Imperial Bank of Germany shows a specie loss of 15,920,000 marks.

**Domestic and Foreign Coin.**

The following are the latest market quotations for American and other coin:

|                                       | Bid.   | Asked. |
|---------------------------------------|--------|--------|
| Trade dollars.....                    | \$ .73 | \$ .75 |
| Mexican dollars.....                  | .74    | .75    |
| Peruvian soles and Chilean pesos..... | .72    | .73½   |
| English silver.....                   | 4.85   | 4.88   |
| Five francs.....                      | .94    | .95    |
| Victoria sovereigns.....              | 4.85   | 4.89   |
| Twenty francs.....                    | 3.88   | 3.93   |
| Twenty marks.....                     | 4.74   | 4.78   |
| Spanish doubloons.....                | 15.55  | 15.75  |
| Spanish 25 pesetas.....               | 4.80   | 4.85   |
| Mexican doubloons.....                | 15.55  | 15.70  |
| Mexican 20 pesos.....                 | 19.50  | 19.65  |
| 100 guilders.....                     | 3.96   | 4.00   |

Copper.—Regarding the condition of the copper market in this country, we have again to repeat the more hopeful reports recently made. There are no items specially interesting to report to-day, but advices from all quarters are unanimous that the demand for consumption is exceedingly heavy, that the stocks held by producers are very insignificant, and that the mines and stamping mills are working full swing. Quotations for both Lake copper and casting qualities remain unaltered at 11c. for Lake and 10c. for casting sorts.

During the past week the London market for Chili bars and G. M. B.'s has been subject to occasional fluctuations; but, generally speaking, the tone has continued firm, and the closing quotations to-day remain pretty near to what they were a week ago, at £42 15s. to £42 7s. 6d. Spot and £42 to £42 2s. 6d. three months. Refined and manufactured sorts continue in active demand, and orders for India are said to be coming in very freely. The latest quotations are: English tough, £47 to £47 10s.; Best selected, £48 10s. to £49; India sheets, £52 to £53; strong sheets, £55 to £56; yellow metal, 5½d.



The exports of copper from New York during the last week were as follows:

|                           | Copper.       | Lbs.    |        |
|---------------------------|---------------|---------|--------|
| To Havre—                 |               |         |        |
| By S. S. La Bretagne..... | 92 casks      | 115,000 | 13,750 |
| .....                     | 130 pigs      | 43,410  | 5,000  |
| To Rotterdam—             |               |         |        |
| By S. S. Amsterdam.....   | 254 bars      | 109,164 | 9,500  |
| To Hamburg—               |               |         |        |
| By S. S. Rhallia.....     | 20 casks      | 25,000  | 3,000  |
| .....                     | 201 pigs      | 71,286  | 7,069  |
| .....                     | 389 bars      | 117,461 | 14,000 |
| By S. S. Bohemia.....     | 407 bars      | 120,435 | 12,500 |
| To Hamburg—               | Copper Matte. |         |        |
| By S. S. Bohemia.....     |               | 234,000 | 19,182 |
| To Liverpool—             |               |         |        |
| By S. S. Alaska.....      | 3,642 bags    | 352,000 | 25,000 |

**Tin.**—Business has been rather active during the week, principally for prompt deliveries, and spot tin still continues very scarce. For prompt delivery as high as 20% has been paid. Several steamers have arrived lately bringing much needed supplies, but these arrivals have had very little influence on prices, which only gave way a trifle to about 20 75, at which figure a large business has been done. Our closing quotations to-day are: Spot, 20.75; October, 20.50; November, 20.30; December, 20.20. The London market has been very steady, with slight fluctuations, and values have given way a trifle at the close to £90 to £90 2s. 6d. spot, and £90 12s. 6d. to £90 15s. three months.

**Lead.**—Beyond the revival of rumors regarding the long-looked-for decision of the Treasury Department on the duty question on imported silver-lead ores, nothing interesting has transpired during the week in the lead market. The Secretary of the Treasury has intimated that something definite will be announced shortly, and from certain remarks reported to have been dropped by him, the parties in favor of the restrictive policy are rather sanguine as to the result. Business has been very dull during the week, and the closing prices are: Spot, 3.90; October, 3.90; November, 3.95.

**The St. Louis Market.**—Messrs. John Wahl & Co. telegraph us as follows: Business has been quiet, and of a limited character, with quotations at 3.70@3.72 1/2 c. refined.

**The Chicago Market.**—Messrs. Everett & Post telegraph us as follows: Our market has been fairly active during the past week, and values have been steady at and around 3.80c. Sales foot up about 500 tons for delivery this month and into November. At the close market is quiet, 3.82 1/2 c. asked; 3.80c. bid.

**Spelter.**—Demand is decidedly more active, and the tone of the market is steady, but quotations are without change at 5.10 to 5.20 for prime Western.

**Antimony.**—The long-continued scarcity of this metal is becoming more conspicuous every day, and in consequence of this prices are exceedingly strong and quotations are being rapidly advanced. Producers in Europe are said to be entirely sold out to the end of the year, and the figures now quoted in London are £71 for Cookson's and £70 for Hallet's. This has compelled dealers on this side to raise their prices also, and the scarcity of the metal for prompt delivery is so extreme that consumers are almost altogether dependent on future arrivals to meet their requirements. We quote Hallet's at 17 1/2 @ 17 3/4; Clarkson's at 18 1/2 @ 19 1/2.

**Quicksilver.**—The market is steadier at £9 5s. in London and 65@67c. in New York for jobbing lots.

**Nickel** is more plentiful on account of recent importations, and prices are easier at from 70@80c., according to quantity and seller.

**IRON MARKET REVIEW.**

NEW YORK, Friday Evening, October 11.

**Pig Iron.**—While there is in this market nothing like the boom that is described as existing in Chicago and Pittsburg, prices here are nevertheless very firm, and throughout the trade a very healthy tone is noticeable, a feeling which is, of course, encouraged by the state of affairs in the West, as well as by the notable increase in the consumption of steel and iron products in all parts of the country. Most of the better known furnaces have very little iron to spare, and some are practically out of the market. Southern irons are particularly scarce here, as the bulk of the product of Southern furnaces continues to be shipped West. The Thomas Iron Company has no iron to offer to new customers, but continues its deliveries on old contracts at unchanged prices. Bessemer pig continues to advance, the latest quotations at Pittsburg being made at nearly \$20. New York quotations in detail are as follows: Northern brands, No. 1 Anthracite Foundry, 18; No. 2, \$16@17; Gray Forge, \$15.50@16.00. Southern brands, No. 1 Coke Foundry, \$17@17.50; No. 2 \$16@16.50, and \$15.50@15.75 for Gray Forge.

We are informed by the secretary of the Metal Exchange that the total sales of pig iron on warrant, since the inauguration of that system of speculation on the Exchange, have amounted to only 200 tons, which, it is said, changed hands last Tuesday. Quotations, on second call this afternoon, of warrants, spot, were 16 1/2 bid and 18 asked. There exists a suspicion in well-informed quarters that these quotations are fictitious. The Warrant Company claims to have 8,000 tons in its various yards on October 8th, and also claims that there are contracts outstanding to store 28,000 tons:

**Scotch Pig.**—The Glasgow market has continued to rise, the latest quotations for warrants being 54s. 1d., a very marked advance over recent quotations. Stock at the Scotch furnaces has become depleted, and consumers have been obliged to draw upon the

supply in store, a proceeding which has caused some alarm among buyers, and there is a strong speculative demand for warrants. The quotations here have advanced proportionately, and sales have been limited to a few hundred tons. We quote in detail as follows: Dalmellington, \$21@21.50; Eglinton, \$21; Langloan, \$25; Summerlee, \$24; Shotts, \$24 1/4 @ 25; Coltness, \$25 1/2.

**Spiegeleisen.**—This market continues firm at the top figures named last week. For 80 per cent. ferromanganese, \$85 is quoted. For spiegeleisen, 20 per cent., \$93 is asked. The large order for 10 to 12 per cent. spiegeleisen, to which we referred last week, has now been placed. In our note of it last week, through an error, it was termed American, which should have read "German."

**Steel Rails.**—There has been an advance of 50c. to \$1 per ton in asking prices for steel rails this week, during which business has been unusually heavy. A number of large roads, including, it is said, the C., B. & Q., the Rock Island, Northwestern, the Seattle, Lake Shore & Eastern, the "Big Four," the Lake Shore and the Michigan Central, are reported to have placed contracts for next year's supplies, which are estimated to aggregate 160,000 tons, of which, of course, the greater part went to Western mills. The Pennsylvania railroad has also closed contracts for 40,000 tons, of which 12,000 went to the Cambria Iron Company, 12,000 to the Pennsylvania Steel Company, and 16,000 to the Lackawanna Steel and Iron Company. The same road will probably also take quantities from other mills, making the total amount purchased about 60,000 tons. These purchases by leading roads naturally exercise a strengthening effect upon the market, and very few of the mills are attempting sales, except at much advanced prices. At mill \$31 is quoted. The mileage of new track constructed during the first nine months of 1889 is given as follows by the *Railroad Gazette*: "The total for the United States is 3,110 miles, and for the United States, Canada and Mexico, 3,750 miles. It appears from these figures that the rate of building in 1889, as compared with 1888, has improved in the third quarter. A new mileage for 1889 of 5,000 miles is not at all an unreasonable estimate. The last three years have accustomed us to such large figures that this seems a small increase, and it is much smaller than the average for the last ten years, which has been about 7,600 miles a year. The amount of road now reported as under construction is about 5,800 miles, against about 4,450 three months ago. The Southern States east of the Mississippi still contribute much more to the total amount built than any other section, viz, 44 per cent. In the first half year this group built 45 per cent. of the whole. In 1888 they built 31 per cent. The Northern States east of the Mississippi have built 20 per cent. against 17 per cent. in the first half year. The Southwestern States, with Kansas and Colorado, have built 19 per cent. against 24 per cent. in the first half year. The Northwestern States contribute about 6 per cent. and the Pacific Coast 11 per cent. of the new mileage so far built."

**Billets, Slabs and Rods.**—Foreign wire rods are now quoted at \$49 to \$50, while American wire mills are asking \$47 for their product. Billets are quoted at \$33 at mill at Pittsburg, which quotation will also apply to nail slabs; tank and shell are held proportionately higher. Foreign billets are quoted at \$40.

**Structural Iron and Steel.**—Prices in this department continue very firm and in the case of beams and channels are further advanced. No new contracts of importance can be recorded as having been closed during the week, but the mills continue well engaged with work. Prices are as follows: On wharf, Bridge plate, 2.25c.; angles, 2.25@2.35c.; tees 2.6@2.7c.; steel angles, 2.35c.; beams and channels, on wharf, 3.1c.

Steel plates are held as follows on wharf: Tank and ship, 2.3@2.5c.; shell, 2.8c.; flange, 2.85@3c.; fire-Box, 4c.

Iron Plates are quoted as follows on wharf: Common tank, 2.25c.; refined, 2.3@2.4c.; shell, 2.4@2.5c.; flange, 3.5@3.7c.; extra flange, 3 1/2 @ 4c.

Bar Iron at mill is quoted at 1.65@1.7c. for common, and 1.75@1.8c. for refined. Deliveries from stores are quoted as follows: Common, 1.9c. base; refined, 2c. base; "Ulster," 3@3.1c. base; "Norway," 5c.; shapes, and Norway nail rods, 5c.

**Merchant Steel.**—Prices of the cheaper grades of steel, particularly, are firm, and open-hearth machinery steel has been advanced to 2 1/2 c. During the week a number of buyers have endeavored to have this year's contracts renewed at the same price for 1890, but so far as we can learn none have been successful. Prices are as follows: Best English tool steel, 15c. net; American tool steel, 7 1/2 @ 10c.; special grades, 13@20c.; crucible machinery steel, 5c.; crucible spring, 3 1/2 c.; open-hearth machinery, 2 1/2 c.; open-hearth spring, 2 1/2 c.; tire steel, 2 1/2 c.

**Rail Fastenings.**—In renewing their contracts for rails the leading roads mentioned above have, of course, placed contracts for rail fastenings, and the consequence has been a stiffening of prices. Quotations delivered are now as follows: Spikes 2.10@2.15c.; angle fish-plates, 1.95@2c.; bolts and square nuts, 2.9@3c.; bolts and hex. nuts, 3@3.25c.

**Pipes and Tubes.**—Nothing new has transpired in this department during the week. The pipe and tube mill continue very busy. Rates of discount on wrought-iron pipe remain as follows: Butt welded, plain and tarred, 50 per cent. discount; galvanized, 42 1/2 per cent. discount; lap-welded, plain and tarred,

62 1/2 per cent. discount; galvanized, 50 per cent. discount. A discount of 57 1/2 per cent. is allowed on boiler tubes of 2 inches and larger, and 52 1/2 per cent. on 1 1/2 inches and smaller.

Cast-iron pipe remains at \$25@28, according to size.

**Old Material.**—The price of old rails is still a matter of discussion. We hear of sales aggregating 800 tons for Pittsburg delivered at \$27.50, which is equivalent to about \$24.50 here. We also hear of sales made at slightly lower figures, but the average quotation may be written at \$24.50 on board cars at Jersey City. The whole supply of old iron rails here is said to amount to less than 10,000 tons, held by some five or six parties principally. The cost of importation is stated to be \$25. Wrought-iron scrap is unchanged at \$20 for No. 1 on board cars at Jersey City.

Cleveland. Oct. 9.

[From our Special Correspondent.]

The iron ore market is very stiff. Inquiries are frequent. All recent sales have been at advanced figures. Among others who have recently been buying Lake Superior ore is the newly reorganized Reading Iron Company. Inquiries have also come in from Eastern furnaces, relative to prices for next year's delivery. Some bona fide purchases have also been made of Lake Superior ores for next year's delivery, at a price on cars at the mine showing an advance of fifty cents per ton over the prices which have prevailed for this year's delivery. Most iron ore men, however, are unwilling to do anything to excite an old-time boom in their business, believing that the result will lead eventually to a corresponding depression in values. Whatever the production may be this year, even though it reaches six million five hundred thousand gross tons, there is now no doubt but what it will be easily absorbed.

Lake freights are \$1.15 from Escanaba, \$1.35 from Marquette, and \$1.45 from Ashland and Two Harbors.

The following quotations show advances of about twenty-five cents a ton on all grades.

| SPECULAR AND MAGNETIC ORES. |                                     |
|-----------------------------|-------------------------------------|
| Bessemer.....               | 65 to 69 per cent. .... \$6.00@6.50 |
| .....                       | 60 " 64 " ..... 5.00@ 5.75          |
| Non-Bessemer.....           | 66 " 69 " ..... 5.25                |
| .....                       | 62 " 65 " ..... 4.50@ 5.25          |
| .....                       | 57 " 60 " ..... 4.00                |

| SOFT HEMATITES DRIED AT 212. |                                     |
|------------------------------|-------------------------------------|
| Bessemer.....                | 62 to 65 per cent. .... \$4.75@5.75 |
| .....                        | 59 " 61 " ..... 4.50                |
| Non-Bessemer.....            | 57 " 62 " ..... 4.00@ 4.50          |

The above prices are delivered on docks at Lake Erie ports.

Louisville. Oct. 8.

(Special Report by HALL BROS & Co.)

The encouraging features that have been noted for several weeks past are still prominent, and prices have been moved up on all grades, and it is difficult to get a supply of Southern irons to meet the requirements of the trade. Much larger business could be done if buyers could get the grades and deliveries wanted, and a number of large orders have had to be turned down in consequence of the iron not being available. It is thought that prices will be moved up still further very soon.

Approximate prices f.o.b. cars Louisville are as follows:

| Hot Blast Foundry Irons.               |                |
|--|----------------|
| Southern Coke No. 1.....               | \$15.50@15.75. |
| ..... No. 2.....                       | 14.75@ 15.00.  |
| ..... No. 3.....                       | 14.50@ 14.75.  |
| Mahoning Valley, Lake ore mixture..... | 18.50@ 19.50.  |
| Southern Charcoal No. 1.....           | 17.50@ 18.50.  |
| ..... No. 2.....                       | 16.75@ 17.50.  |
| Missouri " No. 1.....                  | 19.00@ 19.50.  |
| ..... No. 2.....                       | 18.50@ 19.00.  |

| Forge Irons.            |               |
|-------------------------|---------------|
| Neutral Coke No. 1..... | 14.00@ 14.25. |
| Cold short.....         | 13.75@ 14.00. |
| Mottled.....            | 13.25@ 13.50. |

| Car Wheel and Malleable Irons.  |               |
|---------------------------------|---------------|
| Southern (standard brands)..... | 25.00@ 25.75. |
| ..... (other brands).....       | 18.50@ 19.50. |
| Lake Superior.....              | 32.00@ 33.50. |

Philadelphia. Oct. 10.

(From our Special Correspondent.)

**Pig Iron.**—The unexpected closing of negotiations for large lots of steel rails in this market, and in one or two Western markets, has created a fresh interest in crude iron. Just what the outcome will be no one can tell. Yesterday and to-day a number of good sized orders for forge iron were hastily placed. The only uncertain factor at this hour is the extent of the increased output that may be thrown upon the market during the first quarter of next year. No doubt whatever is entertained as to the wisdom of placing orders to run up to the close of the year for either forge or foundry iron, but makers are particularly shy of accepting winter orders at current rates. Special brands are not to be had for "love or money," as the regular customers have it all engaged. Standard makes are scarcer than they were, but perhaps this is caused by the fact that nobody is offering iron. No Southern irons are offered as was expected. There is more or less quiet talk of an early advance in prices. To-day's Gray Forge quotations are \$15.50@16. No. 2 will bring \$17 without waiting for a second buyer. No. 1 is strong at \$18@18.50, if the buyer has any choice. There are a few cheaper brands on the market.

**Blooms.**—Steel blooms have made another jump on paper at least, as all the mills are sold up and there are heavy requirements in sight. Slabs are quoted as high as \$34.50@35; shell slabs, \$38.90; flange,



\$40.50@41.50. There is no particular change in charcoal or anthracite blooms, and quotations are close to \$53@54 respectively.

**Muck Bars.**—The mills have all the business they can handle, and quotations on new orders are \$29@30.

**Merchant Bars.**—The buyers of merchant iron are evidently banking on the fact that the bar mill capacity is abundantly able to take care of them, and hence orders for forward delivery, except from car-builders, are rare, and prices consequently are not strong, at least as measured by prices in other branches of the iron trade. Prices range from 1.65 to 1.95, with demand increasing among small buyers for best.

**Skelp Iron.**—Inquiries for three to four thousand tons are on hand, but no large sales have been made this week. Quotations, 1.85 for ground and 2.10 for sheared.

**Nails.**—Notices of an advance were received on Monday by several large buyers. Quotations are \$2 at factory and \$2.10 at store for wire. Country buyers have placed large orders this week. There is quite a business in steel nails.

**Wrought-Iron Pipe.**—The market is active, and prices are strong at previous discounts.

**Sheet Iron.**—All the mills are crowded with work, and the market appears to be on the eve of an advance.

**Plate and Tank.**—These products are also apparently on the eve of an advance, but it is learned from inside sources that orders for considerable material are likely to come in before the 15th inst. on options extended 30 days ago. Small random buyers are now paying an advance. Ordinary plates are 2.25; shell, 2.60; flange, 3.25; steel plate is 2.40@2.50.

**Structural Iron.**—The advance on beams and channels of 3/8 has been foreshadowed for some time. Angles were quoted to-day at 2.25 on small lots. Tees, 2.60. Business is crowding makers.

**Steel Rails.**—Sales in Pennsylvania mills this week 55,000 tons, of which the Pennsylvania is credited with an order for 40,000 tons. There are inquiries now in hand for about 50,000 tons. In a small way, brokers are not able to do better than \$30@30.50.

**Old Rails.**—Brokers are unable to promise their customers one-half the rails they want. Tidewater quotations were made to-day at \$25.

**Scrap.**—Old quotations continue, and supplies of choice and No. 1 are exhausted.

**Pittsburg.** Oct. 10.

[From our Special Correspondent.]

**Raw Iron.**—The firmness noted in these columns for some time past continues. Parties who insisted that prices had reached the top some time since have had to pay dearly for their unbelief. Up to this time there was no reason to doubt that the price of raw material was too low, and when every material required to make iron was advancing there was nothing to prevent iron from going up. Notwithstanding the fact that last week's sales exceeded 100,000 tons, the largest ever made in the history of the trade, there is still a good demand, with sales of several round lots at a still further advance. Of course, the sales are principally for future delivery, as there is not a furnace in Pittsburg or vicinity that has any quantity of iron on hand. The largest demand was for Bessemer, which shows a still further advance, and there are some Pittsburg furnaces that are not disposed to sell at present preferring to complete the orders already booked before accepting new ones. The Shenango and Mahoning Valley furnace men are considerably excited over the situation. All of them are well sold up; some of them are asking pretty extravagant figures, showing clearly that they are not anxious for new contracts at the present time. Productive capacity is enormous. Many think it has pretty nearly reached its utmost limit of expansion, yet it appears to be still below what the demands call for. There seems to be a determination to avoid everything in the nature of "a boom," and buyers have been accommodated as far as possible with such lots as would carry them over for a short time. Much will depend, therefore, on the course of events during the next thirty days. The advancement in the East has not kept pace with Pittsburg up to the present. The following are the sales reported October 5th for the week. Raw Iron total tons 100,420 tons, including 37,000 tons Bessemer. The value being \$2,510,106.25.

The following sales will show the real prices in the market:

| Coke and Coke Smelted Lake Ore.       |             |
|---------------------------------------|-------------|
| 5,000 Tons Bessemer.....              | 19.00 cash. |
| 5,000 Tons Bessemer.....              | 19.15 cash. |
| 3,500 Tons Bessemer.....              | 19.30 cash. |
| 5,000 Tons Bessemer.....              | 19.25 cash. |
| 3,000 Tons Bessemer, at furnace.....  | 18.50 cash. |
| 3,000 Tons Bessemer.....              | 19.50 cash. |
| 1,500 Tons Gray Forge.....            | 16.50 cash. |
| 1,000 Tons Gray Forge.....            | 16.50 cash. |
| 1,000 Tons Low Phos.....              | 24.52 cash. |
| 500 Tons Bessemer.....                | 19.60 cash. |
| 500 Tons Special Bessemer.....        | 20.25 cash. |
| 3,000 Tons Bessemer.....              | 20.00 cash. |
| 300 Tons No. 2 Foundry.....           | 17.25 cash. |
| 100 Tons No. 1 Foundry.....           | 18.00 cash. |
| Coke, Native Ore.                     |             |
| 1,000 Tons Mill iron, Cold Short..... | 16.00 cash. |
| 700 Tons Gray Forge.....              | 16.25 cash. |
| 500 Tons Gray Forge.....              | 16.50 cash. |
| 110 Tons No. 1 Foundry.....           | 18.00 cash. |
| 75 Tons White Iron.....               | 15.50 cash. |
| 80 Tons No. 1 Silvery.....            | 18.00 cash. |
| 80 Tons No. 2 Foundry at furnace..... | 17.00 cash. |

| Muck Bar.                                      |                |
|--|----------------|
| 2,500 Tons Neutral, October and November.....  | 30.00 cash.    |
| 1,500 Tons Neutral, November and December..... | 29.45 cash.    |
| 1,000 Tons Neutral, October and November.....  | 29.00 cash.    |
| 1,000 Tons Neutral, November and December..... | 29.50 cash.    |
| 1,000 Tons Neutral, Spot.....                  | 30.00 cash.    |
| Steel Wire Rods.                               |                |
| 500 Tons American Fives.....                   | 45.00 cash.    |
| Steel Bloom Ends.                              |                |
| 2,000 Tons Bloom Ends.....                     | 22.00 cash.    |
| 1,000 Tons Bloom Ends.....                     | 22.50 cash.    |
| 700 Tons Bloom Ends.....                       | 23.00 cash.    |
| 500 Tons Bloom Ends.....                       | 23.25 cash.    |
| Old Iron Rails.                                |                |
| 3,000 Tons American Ts.....                    | 28.00 cash.    |
| 500 Tons American Ts.....                      | 27.50 cash.    |
| Ferro-Manganese.                               |                |
| 200 Tons 80 per cent., imported.....           | 82.00 cash.    |
| 200 Tons 80 per cent., imported.....           | 85.00 cash.    |
| 150 Tons 80 per cent., imported.....           | 87.50 cash.    |
| 100 Tons 80 per cent., imported.....           | 90.00 cash.    |
| Spiegel.                                       |                |
| 200 Tons 20 per cent.....                      | 40.50 cash.    |
| Steel Slabs and Billets.                       |                |
| 4,000 Tons Billets.....                        | 33.25 cash.    |
| 2,000 Tons Billets.....                        | 33.50 cash.    |
| 1,500 Tons Billets.....                        | 33.15 cash.    |
| 1,500 Tons Slabs and Billets.....              | 35.00 cash.    |
| 2,500 Tons Rod Billets.....                    | 32.50 cash.    |
| Skelp Iron.                                    |                |
| 1,500 Tons Sheared Iron, per 100 lbs.....      | 2.25 4 mo.     |
| 750 Tons Wide Grooved, per 100 lbs.....        | 1.92 1/2 4 mo. |
| 500 Tons Narrow Grooved, per 100 lbs.....      | 1.80 4 mo.     |

**Prices.**

| Coke or Bituminous Pig. |               |
|-------------------------|---------------|
| Foundry No. 1.....      | \$18.00@18.25 |
| Foundry No. 2.....      | 17.00@17.25   |
| Gray F. No. 3.....      | 16.50@17.00   |
| No. 1.....              | 15.50@15.75   |
| White.....              | 15.50         |
| Mottled.....            | 15.50         |
| Silvery.....            | 16.50@19.00   |
| Bessemer.....           | 20.50@20.70   |
| Low Phos.....           | 24.00@24.50   |
| Charcoal Pig.           |               |
| Foundry No. 1.....      | 23.50@24.50   |
| Foundry No. 2.....      | 22.00@22.25   |
| Cold-Blast.....         | 25.00@28.00   |
| Warm-Blast.....         | 24.00@25.00   |
| 10 + 12% Speigel.....   | 35.50         |
| 20% Speigel.....        | 40.00         |

\* Ex-ship Baltimore.

**CHEMICALS AND MINERALS.**

NEW YORK, Friday Evening, Oct. 11.

**Heavy Chemicals.**—The future of the English chemical market is becoming more and more uncertain. It is now apparent that two great factors will influence the market for some time to come. In the first place it is improbable that the manufacturers of caustic soda and bleaching powder will be restricted by any form of combination, and competition is unavoidable. On the other hand, the increased cost of fuel, labor and salt will materially increase the cost of production, and higher prices will be necessitated, but little or no benefit will accrue to the manufacturers, as the margin of profit will be smaller. Some interesting information concerning the state of the foreign market is given in our Liverpool and Manchester letters in another column.

Locally supplies are light and the demand continues very liberal. Caustic soda has advanced to \$2.40@2.45 for 70 and 74 per cent., and \$2.60@2.62 1/2 for 60 per cent. The stoppage for about ten days of the Solvay Process Company's works, owing to an accident, has temporarily lessened spot supplies, and the demand for the English article is consequently increased.

Bleaching powder is temporarily scarce on the spot and sales of small quantities have been made as high as 2c. There are only about 100 casks on the spot for good quality. A similar quantity of inferior grade is also in store. Contracts for future delivery can be made at \$1.70@1.80; some have been placed at \$1.75. There continues to be a rumor of very low quotations for next year. We hear of contracts which have been placed on the other side for hard wood packages at an equivalent of \$1.60 per 100 pounds. Most of these low quotations have been made by one maker who is outside of the present combination, and who, in anticipation of its collapse next January, desires to place contracts as early as possible. Speculators on the other side have also endeavored to "bear" the market. A good demand for carbonate of soda ash is reported. We quote from \$1.23 1/4 to \$1.25 for round lots.

Caustic soda ash is dull and in limited request, at \$1.20 to \$1.25. Sal soda is quiet, at 92 1/2 to 95c. for English brands, and proportionately lower for the American product. There is an unusually active demand for refined alkali, for which quotations are as follows: 58 per cent., \$1.15 to \$1.17 1/2; 48 per cent., \$1.22 to \$1.25.

**Acids.**—There have been no important changes in the situation of this market. No definite plan of permanent organization was presented to the manufacturers at their special meeting last Friday afternoon, but as the points at issue are merely matters of detail no apprehension of serious dissensions need be entertained. Mr. J. L. Morgan, Jr., now acts as chairman of the meetings in place of Mr. W. H. Nichols. The next regular meeting will be held on Wednesday afternoon, the 16th inst.; special meetings for the consideration of a plan for permanent organization are held occasionally.

**Fertilizing Chemicals.**—There has been more inquiry from the South this week, and some of the northern makers have also been in the market for small lots. The season in the South is as yet backward. Ammoniates are rather firmer but quotations are still unsettled; in detail the usual price list is as follows: Azotine, \$2.15; dried blood, city, low grade, \$2.10; high grade, \$2.20. For tankage, High grade, 9 to 10 per cent. ammonia and 15 to 20 per cent. phosphate, \$22.50 is quoted, and low grade, 7 to 8 per cent. ammonia and 25 to 30 per cent. phosphate, \$21.50. Fish scrap, \$22@23 per ton, f. o. b. factory. Sulphate of ammonia at \$3@3.05 per cwt. Concentrated tankage, \$2.15. Refuse bone-black, guaranteed 70 per cent. phosphate, \$20@21 per ton. Dissolved bone-black is 90@95c. per unit for available phosphoric acid, and acid phosphate 79@80c. per unit for available phosphoric acid. Steamed bones, unground, \$20@23.50; ground, \$27.

Charleston rock, undried, \$5.75 per ton; kiln dried, \$6.75@7 per ton, both f. o. b. vessels at the mines. Charleston rock, ground, \$11, ex-steamer at New York.

**Muriate of Potash.**—Arrivals of 250 tons are reported. The demand has improved and some of the accumulation on the spot is being worked off; we continue to quote the official prices \$1.80 per 100 lbs.

There has been a very light inquiry for double manure salt, 48 per cent, for which we continue to quote \$1.20 on the spot and \$1.15 to arrive. No important sales of sulphate of potash, high grade, can be reported. We quote \$2.32 1/2 on the spot and the official price, \$2.50, for futures.

**Kainit.**—Stock on the spot has now been reduced to small proportions, and it is doubtful if an order for 100 tons could be filled at present from the supply in store. We quote the syndicate price, \$10.00 per ton actual weight and \$9.75 foreign invoice weight.

Brimstone is quiet at unchanged quotations. There has been more activity in nitrate of soda at \$1.90.

**NOTES OF THE WEEK.**

As announced, the Fertilizer Exchange held a meeting on Tuesday afternoon.

The Lackawanna Fertilizer Company, of Erie, Pa., is reported to be in the hands of the sheriff. The judgments issued upon, it is said, amount to between \$5,000 and \$10,000. The company brought the plant to Erie from Scranton, and after getting started were compelled by the city authorities to move out of the municipal limits. The assets, it is claimed, will cover over the liabilities.

The fertilizer factory of G. Ober, Sons & Co., established in 1857, at Locust Point, Baltimore, was burned on the 10th inst. It consisted of three large buildings, which cost, it is said, \$250,000. The fire started in the acid storage room, perhaps by spontaneous combustion. It is reported that fully \$260,000 worth of damage was done to the two buildings and the stock they contained.

**Liverpool.**

Oct. 2.

(Special report by Messrs. J. P. Brunner & Co.)

**Chemicals.**—"Since our last, the principal topic here has been the announcement of the Salt Union with reference to salt contracts for chemical-makers' requirements. The Union offers to make contracts for a period of five years on the basis of present prices, or at an advance of 4s. 6d. and 2s. 6d. per ton for one year and two years respectively. The chemical makers consider themselves badly used, and grumble considerably. Some of the Widnes manufacturers met yesterday to consider the position, but the meeting was adjourned without anything being done, we understand. It is reported to-day that three makers have already contracted with the Salt Union for their supplies over 1890-1894.

"On the spot our market is very steady, supplies generally being limited, and bleach especially being very scarce for prompt delivery. Soda ash firm for carbonated, but little doing in caustic ash. For prompt delivery, nearest values are: Caustic ash, 48 per cent., 1 1/2 d.; high test, 1 1/2 d.; carbonate ash, 48 per cent., 1 1/2 d.; high test, 1 1/2 d. For 1890 contracts a considerable advance on spot prices is asked. Soda crystals firm at £2 12s. 6d. @ £2 15s., and business done at the lower figure. Caustic soda is scarcely so firm for 70 per cent., as, although makers are mostly fully sold at present, there is more offering in second hands. Sales are reported at £7 3s. 9d. to £7 5s., and these represent values at the close. Other strengths are scarce, and held as follows: Sixty per cent., £6 7s. 6d. to £6 10; 74 per cent. £5 2s. 6d. to £5 5s.; 76 per cent., £8 15s. Sales of 70 per cent. are reported over all next year at from £7 7s. 6d. to £7 10s., but a number of makers hold aloof. Bleaching powder is difficult to get hold of for prompt delivery. Some sales were made last week at £6 17s. 6d., while £7 has been paid to-day, and the higher figure refused in some instances. Over all 1890, business in softened at makers' works is reported at £5 5s., but 5s. per ton more money is generally asked, and some makers decline to quote, expecting that they will do better by holding off. Chlorate of potash held for 4 1/2 d., and some makes held for more money. For contracts over the next twelve months 5d. is about nearest quotation. Bicarbonate of soda in demand at £4 15s. per ton for 1 cwt. kegs, with usual allowances for larger packages. Sulphate of ammonia quiet at £12 to £12 5s. per ton for good gray 24 per cent., f. o. b. Liverpool."

**Manchester.**

Sept. 28.

[S. W. Royce & Co.'s Report.]

**Chemicals.**—The strong tone that we had to announce last month in the alkali branch continues, and



salt-cake is now quoted at 26s. to 27s. per ton. Caustic soda remains firm at the advance for present and early delivery, but the volume of fresh business is scarcely so large.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, Oct. 11. Bricks.—This market shows a hardening tendency. There was so much stormy weather during during the month of September that the production was much less than usual, and consequently makers are now concentrating all their efforts on making up for lost time before the advent of cold weather.

Lime.—Rockland makers have not increased their production and consequently lime has been rather scarce in this market. The demand continues fair at the association prices.

Cement.—New York dealers will be interested in the following from the Montreal Gazette: "The stock

of cement in Montreal continues very small and the prospects are that it will remain so for some time yet, as dealers in many cases are not receiving sufficient to fill orders, and are behind hard with such; consequently the situation of the market at present is very strong and much higher prices are looked for before long.

CONTENTS.

Table listing various articles and their page numbers, including Metallurgy of Steel Supplement, The Nicaragua Canal, and Mining News.

Table listing various articles and their page numbers, including Impressions and Reminiscences of the Engineers, European Trip, and American Institute of Mining Engineers.

Table listing various articles and their page numbers, including Mining News, Kansas City, London, New York, Paris, and various stock market reports.

IMPORTS AND EXPORTS OF METALS AT NEW YORK SEPTEMBER 28 TO OCTOBER 5, 1889, AND FROM JANUARY 1.

Table of imports and exports for various metals including Spelter, Nickel, Antimony, Pig Lead, Tin, and Tin Plates, with columns for Week, Year, and Tons.

Table of imports and exports for various metals including Lublin & Estey, Lundberg, G., Milne & Co., and others, with columns for Tons and Corres. date.

Table of imports and exports for various metals including Heyn, A., Hugill, Chas., Jansen, J. A., and others, with columns for Tons and Corres. date.

EXPORTS.

Table of exports for various metals including Copper, Copper Matte, and Copper Ore, with columns for Pounds and Corres. date.



DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Table with columns: NAME AND LOCATION OF COMPANY, CAPITAL STOCK, SHARES, ASSESSMENTS, DIVIDENDS. Lists 143 mining companies with their respective financial details.

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Gold, Silver, Lead, Copper. \* Non-assessable. † This company, as the Western, up to Dec. 10th, 1881, paid \$1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid \$875,000 in eleven dividends, and the Terra \$75,000. ¶ Previous to the consolidation in Aug., 1881, the California had paid \$31,320,000 in dividends, and the Con. Virginia, \$240,000. \*\* Previous to the consolidation of the Copper Queen with the Atlanta, Aug., 1885, the Copper Queen had paid \$1,350,000 in dividends. †† (1,500,000)



NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table of New York Mining Stocks Quotations, divided into Dividend-paying and Non-dividend-paying mines. Columns include Name and Location of Company, dates from Oct 5 to Oct 11, and Sales.

\*Ex. dividend dealt in at the New York Stock Ex. Unlisted securities †Assessment unpaid. Dividend shares sold, 20,220 Non-dividend shares sold, 30,750. Total New York, 50,970.

BOSTON MINING STOCK QUOTATIONS.

Table of Boston Mining Stock Quotations, listing company names, dates from Oct 4 to Oct 10, and sales figures.

Boston: Dividend shares sold, 6,303. Non-dividend shares sold, 8,950. Total Boston, 14,953.

COAL STOCKS.

Table of Coal Stocks, listing company names, par value, and prices from Oct 5 to Oct 11.

San Francisco Mining Stock Quotations.

Table of San Francisco Mining Stock Quotations, listing company names and closing quotations from Oct 4 to Oct 10.

\*\*Of the sales of the stock, 31,705 were in Philadelphia, and 78,920 in New York. Total sales 201,164.

STOCK MARKET QUOTATIONS.

Table with columns: COMPANY, Bid, Asked. Includes Baltimore, Md. and Birmingham, Ala. sections.

Table with columns: COMPANY, Bid, Asked. Includes Kansas City, Mo. and Pittsburgh, Pa. sections.

Table with columns: COMPANY, Par value, Bid, Asked. Includes St. Louis, Mo. section.

Table with columns: COMPANY, Highest, Lowest. Includes Foreign Quotations, London, Sept. 28.

Table with columns: COMPANY, Bid, Asked. Includes Paris, Sept. 26, and St. Louis, Oct. 9.

Table with columns: COMPANY, Bid, Asked. Includes Cleveland, Colo., Cleveland, Idaho, Golden Era, Mont., Golden King, etc.

Table with columns: COMPANY, Bid, Asked. Includes Electric Stocks, Oct. 4.

Table with columns: COMPANY, Bid, Asked. Includes Trust Stocks, Oct. 11.

Table with columns: COMPANY, Bid, Asked. Includes Foreign Quotations, London, Sept. 28.

Table with columns: COMPANY, Bid, Asked. Includes Paris, Sept. 26, and St. Louis, Oct. 9.

CURRENT PRICES.

These quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Table listing various chemicals and minerals with prices per 100 lbs or other units.

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THE RARER METALS.

Table listing various rare metals with prices per lb or other units.

RARE MINERALS.

Table listing various rare minerals with prices per lb or other units.

BUILDING MATERIAL.

Table listing various building materials with prices per unit.

THE ENGINEERING AND MINING JOURNAL will thank any one who will indicate any other articles which might with advantage be quoted in these tables or who will correct any errors which may be found in these quotations.