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THE volume, "The Mineral Industry: Its Statistics, Technology and Trade," which was issued in March last, contained a marvelous amount of statistical data, made up for the most part to the close of the year 1892.

It was in some cases impossible to get the full returns of production of all the mines, and as later reports came it was found necessary to revise certain of the figures that we had used. It was also inevitable in such an extensive work, completed so rapidly, that some clerical and typographical errors should have occurred. Such errors have been noted and are now corrected in a small sheet of errata, which will be sent to any one requesting it, and who sends a postage stamp for its transmission. The immense edition of the book has been exhausted, and the new edition now being printed is from the revised plates.

Work on the volume for the current year 1893 is being actively pushed. The co-operation of those who have statistics of any department of the mineral industry in any part of the world is cordially invited.

THE great Exposition at Chicago closed quietly on October 30th with no further ceremony than a simple formal announcement by Director-General DAVIS that the fair was over. The absence of more imposing ceremonies was partly due to the deep feeling in Chicago over the murder of Mayor HARRISON two days before. The work of removing the exhibits has already begun.

ENGLISH advices state that we were misinformed as to the price at which Welsh anthracite can be put on board vessels at Swansea (not Cardiff); that it cannot be done at 3s. 6d. per ton, as we were informed. We accept the correction as to the price named, and regret that such an error should have appeared in these columns. The price named was probably cost of mining. There is no question as to the negotiation having taken place.

THIS week's report from the Joplin ore market shows a further decline in the price of zinc ores, which were last week quoted at an average of \$16.50 per ton, and are now at \$14 to \$16, only exceptionally good ores bringing over the last-named price. Lead ores, on the other hand, show an increase in price from \$17.25 to \$18.50. The decrease in output of silver-lead ores in the West is thus helping the lead mines of Missouri and Kansas materially.

THERE has been recently considerable discussion in the zinc market abroad over the intentions of the Société de Mafidano, which, it was reported early in the year, proposed to erect spelter works in the north of France. This step, it was feared, would not only disarrange the agreement of the syndicate with reference to production, but also the market for zinc ores, the Mafidano company, whose mines are situated in Sicily, being a large producer of some of the best ore which reaches Antwerp. It seems improbable, however, that this company will launch out on such an extensive scale as has been rumored, with the zinc market in its present condition. The establishment of large zinc works is a matter requiring much time, and it is probable that the only truth in these reports concerning the Mafidano company has been the preparation of plans, leaving the final decision to be made at a future date. Already this year one new zinc plant has been put in operation in Belgium, and another, the Société des Zincs de la Campine, has been chartered, with a capital of 960,000 florins, to erect works at Budel, in Holland.

THE price of aluminum, which a year or so ago declined to 50 cents a pound, but subsequently rose to 75 cents a pound, at which it now stands, is about to decline again to lower figures than ever before reached. The day is not distant when this interesting and, for many purposes, valuable metal will be produced in what would now appear enormous quantities and at prices which will give it many new uses. The Aluminium-Industrie-Actien-Gesellschaft, of Neuhausen, in Switzerland, informs us that the increase of its dynamo capacity to 4,000 H. P., and some improvements in the processes employed, have enabled it to increase largely the production of aluminum, and that the price from January next will be five francs per kilogram, or 45 cents per pound. It must be remembered that owing to the low specific gravity of aluminum, if equal bulks, not weights, of the different metals are taken, this price is really lower than that of copper as recently as 1890, and is actually less than that of tin at the present time. Such a reduction in price is likely to be followed by a very considerable increase in the use of the metal for various purposes.

THE estimate of the cost of converting pig iron into steel rails, which we last week said "can scarcely exceed \$5.50 per ton," has been criticised by some of our largest steel manufacturers. The figure mentioned, which did not include interest, depreciation, alterations, etc., was based upon those given in CARROLL D. WRIGHT'S report to the Bureau of Labor, 1890, being reduced from his figures proportionately to the reduction which has taken place in wages and material since that time.

It would of course increase this figure to add to it interest on capital invested in plant and in stock; depreciation of plant with necessary

changes to keep up with the latest practice—in other words, to make the cost of conversion include a fair minimum manufacturers' profit.

One of our critics writes us: "The average cost of converting pig iron into a ton of steel rails in American works is not less than \$10, correctly figured. I mean that the concern that runs year after year, keeps up its works, meets bad debts, pays interest on capital and interest on stock materials, will find that \$10 per ton above the cost of pig iron will not more than cover." The present is not, however, a time of average costs, in fact in most departments of manufacturing it is probable that they are now fully 20 per cent. below "average," and most manufacturers are quite satisfied at the present time if they can get the minimum manufacturers' profit, of actual present cost and interest on capital.

The extremely low prices at which steel billets have recently been sold (\$17.35 per ton) shows to what perfection of manufacturing and to what economy some of our works have attained.

AFTER REPEAL.

The repeal of the Silver Purchase Act received on November 1st the signature of the President, and henceforth, so far as this country is concerned, silver must depend for its value on the open and unsupported market. The stoppage of free coinage, and the uncertainty as to the future value of the metal lessens its uses in the arts and will eventually lead to a lessened hoarding of silver by the Eastern nations. The price declined this week to 68 cents per ounce, and it will probably go lower. It may be more agreeable to close our eyes and ears to disagreeable facts, but it is the part of wisdom to study carefully the situation, whether the task be pleasant or otherwise, and to prepare for the conditions which must obtain in the not distant future unless the nations awake to the dangers of an appreciating standard, which they would have with silver demonetized in international transactions.

The United States now produces silver as cheaply as, and can produce it more cheaply than, any other country. With the highest wages, the highest cost of living and the highest priced supplies in the world, we have produced the silver at an extremely low price, inundating and demoralizing the market. Now we can, by bringing down to reasonable limits our western miners' wages, cost of living, railroad freight, etc., reduce materially the cost of production and command the markets of the world for the white metal. This will close many foreign mines and bring further force to the movement for universal bimetallism.

Since the fears which the financial world had for the stability and value of our money must now disappear, vast amounts of foreign capital will seek investment here, while the very low prices at which our raw products are selling, and at which we can now manufacture, will add largely to our exports and bring us great quantities of gold.

The tide of gold which will inevitably flow to us in the future will not only give us abundance of money, but will drain Europe. Will it not also force the value of gold upward, raise the Bank of England rate in a vain effort to hold back the ebbing tide, and raise the cost of manufacturing there, unless wages be reduced, when the horrors of long and bitter strikes would follow? The inhabitants of India and the other Eastern peoples who, by hoarding silver in ornaments and otherwise, because it was the safest and most agreeable way of holding and demonstrating the possession of wealth, will soon learn that silver has lost its value; that their ornaments can no longer be converted into money, except at a heavy and fluctuating loss, and that the possession of gold, not silver, is the prime evidence of wealth. They will then buy gold. All the world will want gold.

The more intensely and rapidly these elements in the great problem develop themselves, the quicker will come the appreciation of the dangers of suddenly destroying the value of the sole standard of two-thirds of the world's inhabitants. It is not the United States that will suffer now. England and Germany, who have an enormous trade in manufactured goods with nations which use only silver, must suffer terribly from the declining price of that metal. The effects will show themselves in closing factories, and in the transfer of capital and manufacturing to this and some other countries.

The United States, so rich in everything, now feeds the artisans of Europe with her breadstuffs, and can feed her own people at a still lower cost. We are now producing iron, steel, machinery, cotton, cotton goods and many other things at least as cheaply as they are produced elsewhere. We are exporting to the gold standard countries much more (mostly in raw materials) than we import, and will draw their gold here to add to our own great output.

This country will not be the sufferer in the struggle for industrial existence; it is the safest and most profitable field in the world for the investment of capital. With untold wealth, with unrivaled natural resources and with a population unequalled for intelligence and enterprise, it will become the workshop for a great part of the world. Nevertheless we will welcome an agreement among the nations for the use of both gold and silver and for regulating the world's money on the lines of bank clearing-houses, for we believe it will inaugurate a period of unexampled prosper-

ity throughout the world, in which we will participate, but we can calmly await the awakening of those still more interested in it.

ONE REMEDY FOR TRADE DEPRESSION.

It is an old and a good maxim in war to imitate the tactics of a successful enemy, and in trade competition, which to some extent resembles warfare, the same rule ought to hold good. If we want to secure trade we should watch our competitors, and where they have succeeded we should imitate their methods, and, if possible, improve upon them. On this point the time seems opportune for a discourse, the text for which we find in a report just made public from United States Consul MONAGHAN, who is stationed at the important industrial center of Chemnitz, in Germany. He calls attention to the fact that the German manufacturers who have for years been constantly studying how to extend their trade and find new markets, are just now preparing for special efforts to secure foreign trade, to which the admirable exhibit made by them at Chicago was only a preliminary. They have attracted the attention of the visitors by this, and they intend to enlarge and improve upon the lesson in a thoroughly practical way. Says Mr. MONAGHAN's report:

"Engineers are to be sent to Brazil, La Plata, Mexico, Chile, Peru, and other South American states. The purpose is to drum up trade. The costs are to be proportioned to the number of persons employed by the factories sending the engineers. It is hoped that enough will subscribe to keep the cost down to 50 or 75 cents per person employed. As an aid to the engineers, vast numbers of illustrated machine-explaining catalogues, printed in Spanish and the various languages of the people or colonists among whom they are to circulate, are to be sent before and after the engineers. Thus far, wherever and whenever the propositions to send engineers and catalogues have been discussed they have been voted for unanimously. It is the universal opinion and conviction that this is the only way to keep up the progress of the past 20 years and the only way to win a fair remunerative share of the foreign trade. The Foreign Office and the Prussian Minister of Commerce have expressed a lively interest in the movement, and have promised it aid. Nineteen firms, representing 7,506 workmen, have already subscribed. It is expected, so popular is the matter becoming, that many more will soon join. It is also proposed to have the engineers take orders for iron and steel products wherever they go whenever they can. This will help to keep down the costs to those taking part, and will permit of a much larger number of engineer agents being sent. The number, it seems, is to be limited only by the subscriptions. . . . The reports are to be the common property of all the subscribing concerns. It has been proposed to divide the world up in sections; to unite the millowners in groups, giving to each group a section. In this way manufacturers preferring South America to Africa can enroll themselves in the South American group, and so on. These plans have already been discussed, and have found favor among the various mechanical unions of the empire."

Let us see if we cannot apply this excellent plan. Our own home market, as a rule, has been so large that our manufacturers have been generally employed in supplying it, and have made no organized efforts to secure foreign buyers. Moreover, it has grown to be a sort of tradition that, with our higher wages and higher costs of raw material, we could not compete with England, Germany and Belgium in the markets of the world. That this tradition should be disregarded, and that we are really prepared for the competition, a few comparisons will show.

The latest English quotations now before us give the prices of No. 1 foundry iron at \$9.12; ordinary Scotch pig, \$10.50, and Bessemer pig \$12 per ton. Certainly our furnacemen can tell of prices fully as low as these. Cast-iron pipes are quoted at \$22.80 to \$26.40 per ton at works, prices which are more than matched by the bids, ranging from \$19.20 to \$21.20, noted this week in our news columns. Bessemer steel billets are quoted at \$20.40 to \$21.60; Siemens steel bars \$21.60 to \$22.80; Bessemer steel rails (heavy sections) at \$18 to \$19; angles and shapes at \$26.40. But, as we showed last week, steel billets have been sold in Pittsburg at \$17.35 per ton, and open-hearth steel at \$23, while the present actual cost of steel rails at some of our mills is probably not over \$19. Here our competitors have surely no advantage over us in cost of material.

At the present time, for instance, most of our rail mills are idle or only partially employed. Why should not the temporary cessation of home demand be made up by orders from South America, Australia or Japan? We are able to fill them at as low a price and of as good quality as the mills of Barrow or Bochum or Seraing; and the same ought to hold good with steel plates and structural shapes.

We have said nothing of more highly finished products, of machinery and tools in which the greater adaptability of our designs, our better shop methods and the greater efficiency of our labor more than offset our higher rates of wages. In this direction something has already been done, and English manufactures are much disturbed at the extent to which our mining machinery has gone into the South African and Australian markets, which they claim as especially their own. This subject is too extensive for the limits of a single article, however, and must be reserved for future treatment, with some other considerations of means and methods.

The point to be considered is that the present time of depression and low prices is the time to extend our trade. Let our manufacturers imitate the Germans; let them organize, work together, seize the opportunity, and success will follow. Great as our home market is, that of the world is greater, and we shall find our advantage in securing the foremost place in it, as we surely can if we try, and as we surely must do in the not distant future.

NEW PUBLICATIONS.

GEOLOGY OF COLORADO AND WESTERN ORE DEPOSITS. By Arthur Lakes, professor of geology at the State School of Mines, Golden, Colo. Denver, Colo.; The Osain & Hardy Company. Pages, 314; illustrated. Price, \$2.50.

The present year will be remembered for the numerous contributions that have been made to the literature of economic geology, among them being such important works as Professor Kemp's "Ore Deposits of the United States," Professor Posepny's "Genesis of Ore Deposits," and the valuable series of papers read at the Chicago meeting of the American Institute of Mining Engineers. We have now an addition to the list in Professor Lake's book on the "Geology of Colorado and Western Ore Deposits," which is less broad in its scope than the others, being restricted to the description of the economic geology of a particular section of the country. There is a need for special treatises of this kind, since the comprehensive works like that of Phillips, and the more recent one of Professor Kemp, however admirable, cannot go into full details in discussing single districts except those of great importance like the Comstock, Eureka and Leadville, etc. It is with much regret, therefore, that we are obliged to confess our disappointment in this new book of Professor Lakes.

It should be said in justice to the author, however, that he explains in his preface that his treatise, which contains the substance of a series of elementary lectures delivered before the students of the Colorado State School of Mines, was prepared with a view of meeting the needs of "the general public, of the ordinary miner, and of the unscientific many, rather than with an idea of offering matter for the discussion of the scientific few." Compiled on this plan, the first part comprises a rough sketch of general geology, with especial reference to the local conditions of Colorado; the second treats of the phenomena of mineral deposits and ores; part three consists of descriptions of the principal mining districts of Colorado; while in part four some of the mining districts in other parts of the Rocky Mountains are treated in the same manner.

The first half of the book, though forming a simple exposition of the general principles of geology and ore deposits, presented in clear, unpretentious language, must be criticised for its inexact generalizations, and looseness, and sometimes inaccuracy of statement. There are the same faults in the second half, which is made up largely of papers by various people in technical and other publications, not always selected with good judgment. For example, the article descriptive of the Treadwell mine in Alaska, by Mr. H. P. Cushing, which was based on "a two-hours' examination of the mine, and a half-hour's conversation with its superintendent," is hardly authoritative enough to be incorporated in a work like that before us. That this kind of matter should have been used in the compilation is very unfortunate, for as the book does not pretend to add anything to the discussion of mooted geological questions, it could only be valuable as a summary of an important mass of testimony, and in this it is far from successful.

TRAITE DES GITES MINERAUX ET METALLIFERES. By MM. E. Fuchs et L. de Launay. Paris, France: Baudry & Cie. In 2 volumes. Pages 823 and 1041. Illustrated.

This book is handsomely printed and elaborately illustrated by maps, sections, and, in several cases, by colored geological plates. The foundation of the treatise is the course of lectures in economic geology ("geologie appliquee") which have been delivered in the Ecole Superieure des Mines in Paris, since 1879. The senior author, Prof. E. Fuchs, held the chair, of whose duties they formed a part, until his death in 1889, and was then succeeded by the junior author, Prof. L. de Launay, the present incumbent. As we learn from the preface, the materials were mainly assembled by M. Fuchs, but they have been elaborated and brought down to date by M. de Launay, who has added many results of his own travels. The work is quite encyclopaedic in scope, and aims to describe, not alone the geological occurrence and distribution of the useful minerals throughout the world, but also to outline their applications, their methods of mining and treatment, statistics, etc. Where possible, the modes of origin are likewise discussed. All this will appear from the outline of the plan, which M. de Launay gives as the one followed for each metallic or earthy mineral: "1. Nature of the substance; its properties, physical and chemical; its applications, principal centers of production, approximate value. 2. Description of the deposits, involving their history; the general geology of the region; the special geology of the deposit in question; methods of exploitation, of treatment, and, when of special interest, of transportation; data, statistical and commercial."

It will at once appear that to treat the mineral resources of the world in this elaborate manner is a huge task, and we are not surprised that our authors have filled two large volumes, containing in all nearly 2,000 pages, and then have made no mention whatever of the most important of all minerals, coal. In general, we may say that the work has been carefully done, and that it reflects credit upon its authors. An enormous amount of useful information has been brought together, which is, in many cases, not elsewhere accessible, and has been edited with much pains. The bibliography of each subject and district is given at length, and the literature is thus made available to those desiring to consult it. A truly scientific attitude has been preserved by the authors, and they have brought an excellent preparation to the task. The shortcomings of the book are due to the inevitable limitations of so extended an undertaking. No one man can be in touch with the literature of so many countries as are involved, and while for his own and for his immediate neighbors, as in the case of M. de Launay, he may write from full knowledge, yet when he comes to treat of the United States, for instance, a distant land, he does not show the familiarity with authorities, and the discrimination among them, which would make his work in all respects reliable. Thus, he often quotes Davies, the English writer of a book somewhat similar in scope to his own, but immensely in-

ferior to it, whereas, no American writer would pay much attention in matters American to the "Treatise on Earthy Minerals and Mining." While M. de Launay has read the reports of the Pennsylvania Geological Survey on oil and gas, he draws fully as much on the "Practical Treatise of Petroleum," by Benjamin Crew, published in London, and largely overlooks the recent work of Edward Orton, in the Ohio reports, and of I. C. White in scattered papers, who are our best authorities on these subjects. Many other similar points will be made in the following running comment, but what we find true of our own country, we may infer for Australia or any other land remote from Paris and large enough to furnish an individual subject by itself. We shall expect the literature of the future in economic geology to take this direction, of individual and complete treatises on the resources of single countries or of related groups, and thus to be based, as much as possible, upon personal knowledge and discriminating compilation.

The work opens with the carbon minerals, but, as already noted, it curiously omits coal. The ones treated are, the diamond, graphite, jet and various hydrocarbons, such as gas, oil, asphalts, bitumens, etc. The discussion of the diamond is excellent and thorough, although it strikes us that the work of our countryman, H. Carvill Lewis, on the origin of the South African gems, receives undeserved neglect. The Dixon Crucible Company, of Jersey City, would hardly relish the statement, under graphite, that the Ticonderoga deposits of this mineral are worked by "une compagnie 'Anglaise' (la compagnie Dixon.)" Under natural gas, we are not prepared to admit the statement on page 56, that the gas is derived from lower beds than the oil. They both go together, and the storage is rather a question of concentration in a porous stratum, under an impervious cap, and of being forced there by hydrostatic pressure, than of depth. In connection with gas, the anticlinal theory of storage, though mentioned under oil, does not receive attention, but it is quite as important for the one as the other. M. de Launay inclines to inorganic, chemical methods for the explanation of the origin of oil and gas, whereas, in America, we count these of small significance.

The pages on asphalts, bitumen and the like are excellent, and will be found valuable for reference. The next chapter, entitled "Silicates," is a brief review of gems and other useful minerals. We do not note under mica (page 226) its applications as an electrical non-conductor, although, as regards the future, these are perhaps the most promising of all. The description of borax is very good, and California receives very satisfactory attention. Borax Lake, however, mentioned as a present source of the mineral, has not been worked in years. Under sulphur we find no reference to the quite extensive deposits of Utah and Nevada, nor under pyrites, to the beds of this mineral in the Appalachian belt. In other respects the chapter, especially as regards Sicily, is a very valuable one.

Much space is given to the phosphates, and the descriptions are well illustrated. The accounts of foreign sources will be very useful for reference in America, while the portion on American localities bears internal evidence of having been based on the latest literature. The portion which treats of Stassfurt, under potassium, is extremely interesting and well illustrated. Under sodium the salt deposits of the world are briefly reviewed. The American sources are little more than cited, and our most important ones (the rock salt of central New York and of Kansas and the brines of Michigan) receive less attention than some of much inferior moment. Under calcium, we find a general summary of limes and cements, limestones and marbles, gypsum and plaster, but without reference to America. Under magnesium, talc and soapstone are not noted, although both deserve it. The deposits of bauxite, other than those in America, receive satisfactory treatment, but we find no reference either to Arkansas or Georgia. Under corundum and emery, the interesting geological association of the Georgia corundum with the olivine rock dunite is entirely overlooked, while the small emery mine at Chester, Mass., is given extended mention. An account of kaolin and clay closes the non-metallic portion of the treatise.

The deposits of iron ore are introduced by extended statistics, which give a very excellent idea of the relative importance of the different productive centers. The ore bodies are then taken up under four classes: 1. Inclusions in rocks (original crystallizations from an igneous magma); 2. Contact deposits; 3. Veins; 4. Stratified, sedimentary and surface deposits. This is a good, working division, and under it the geology of iron can be well set forth. Where possible, as in the last group, the ores are ranged by geological age, from the oldest to the latest. Some errors regarding our American iron mines have crept in. The walls of the veins at Iron Mountain, Mo., can hardly be described as a "melaphyre porphyroide," as they are quartz and feldspar porphyries. In speaking of Lake Superior hematites, no mention is made of Irving and Van Hise, to whom we owe so much of our knowledge regarding them. The Menominee district is casually referred to, but the Gogebic and Vermilion Lake regions (and, of course, the Mesaba) are entirely omitted. Apparently Wedding's paper, written in 1876, was the principal one consulted. Our iron mines of the Great Valley, pages 745, 746, receive very slight attention. The principal brown hematites are cited as "Lehigh" and "Chatanooga," and some doubt prevails in our author's mind as to whether they are well characterized veins, or due to secondary actions. We have an abundant literature on them, that would make this clear. The Clinton ores receive a half-dozen lines. They are stated to occur in New York, "Pensylvanie," and on the west coast of Lake Michigan, but are nevertheless the object of no great development ("n'est néanmoins l'objet d'aucune grande exploitation"). Alabama people would be inclined to dispute this statement. In fact, American iron mines, with the largest production of any country, receive but six pages of description in a total of 163, and the subject matter seems to have reached our authors, not direct from original sources, but through two or three intervening media. European ore bodies are far better described, and much may be said in praise of the text.

The second volume opens with manganese. The general bearings of the markets are well stated, and an interesting account is given of the

world's resources. Franklin Furnace and Ogdensburg, N. J., have somehow been omitted from the list of American localities. Indeed, the only mention of these important zinc and manganese mines is as a source of molybdenum, whose mineral molybdenite is one of the rarest things in the region. The report of R. A. F. Penrose on manganese, to the Arkansas Geological Survey has been overlooked, although it is far the most complete work on manganese ever issued. Chromium is well described, and the portion on nickel is well divided, as to geological occurrence, into oxidized ores, pyrrhotites and arsenides. New Caledonia naturally receives very thorough treatment. Cobalt is described by itself, but it is a question, if it can be well discussed aside from nickel, without undue repetition. Under titanium we find the remarkable statement that titaniferous ores occur in New York in serpentine. The chapter on tin is excellent and the accounts and bibliography of the deposits in the East Indies, Australia, and other South Sea localities will often prove useful for consultation. The lesser metals, bismuth, tungsten, molybdenum and uranium hardly deserve mention here. Under antimony we find no reference to our American sources, which is an unfortunate omission, even though they are of moderate importance.

The chapter on Copper is one of the best in the book. A very excellent review of the sources and general relations of this metal is afforded. The ore deposits are treated under the same heads that were used for iron. Some American inaccuracies may be noted. Thus, on page 257 the monotonous, Triassic diabases of New Jersey are called diorites and melaphyres. Coke is said to cost 260 francs in Arizona (or about \$50) per ton, and the necessary copper contents of a profitable ore are placed at 15%. These figures are, of course, out of date to-day. Under copper pyrites, pages 278-304, our Appalachian deposits should have been noted. While the correct spelling of our American names is not an easy thing for a European, the mistakes all through this work, really show great need of revision. The map of the Lake Superior copper region on page 312 is a shining example. It contains "Cooperharbour" (for Copper Harbor) Antonagon (and in the text Otonagon), Reweenaw and Cincinnati. On the same page Copperfels appears for Copper Falls, and closely associated are others more excusable. The descriptive matter is, however, very commendable, having been based on a goodly list of papers.

As stated above, the unique and rich ore body at Franklin Furnace, N. J., is entirely omitted under zinc, and willemite is not cited as an ore of zinc, whereas at Franklin Furnace it forms the most abundant and productive mineral. We also fail to discover mention of our zinc mines (with their insignificant lead) in southwestern Missouri, which are now our principal source of this metal. But the European sources of supply receive very full treatment and are copiously illustrated by cuts. The genetic relations of calamine and blende are especially well brought out. American omissions are far less serious under lead, for we have a somewhat more prominent literature on our important lead and lead-silver mines. The ore bodies are classified as follows: 1. Veins and fractured areas; 2. replacements in limestones; 3. sedimentary deposits. The authors are well up to date and give limestones the prominence which they deserve, and the replacement method of formation receives its merited recognition. Still, south-east Missouri, our one region where lead is sought for its own sake, is overlooked. Monographs of the United States Geological Survey are fully quoted and some elaborate maps are reproduced, not, however, without the usual orthographic slips.

Favorable comment may be made on the chapter on Mercury. The authors have read the literature with care and have given a very complete resume. Mr. Becker's monograph is copiously quoted. Under Silver a valuable review is given of the history of this metal and of its economic relations. The review is brought down to date, for the course of affairs in America, as late as January, 1893, is commented on. The ore bodies are discussed under the following heads: 1. Veins with a calcite gangue; 2. veins with a quartz gangue; 3. galena, blende and argentiferous pyrites; 4. argentiferous gray coppers. This is a difficult arrangement to carry through with any success. Countless veins would belong under 2, 3 and 4, all three. Under 1, we do not see either Silver Islet or Batopilas cited, although both are fine illustrations of the type.

The introductory, statistical and general review of Gold is well done, and with the one on silver furnishes good reading in the present crisis. The ore bodies are then discussed under the following subdivision: 1. Veins with gold, having a sub-head for tellurides; 2. sedimentary deposits. If the authors had regarded geographical considerations under No. 1, some advantages would have been gained. For instance, Venezuela is separated by 10 pages from Panama, with Great Britain and Russia in between. Under the auriferous gravels of California, our authors speak of three kinds, adding "plateau gravels" to the deep or high, and the modern stream gravels, that we recognize. The justification of this is questionable.

It seems somewhat invidious to select and place such emphasis upon omissions and errors when there is so much excellent material in the book that is passed without comment. But we repeat that for the lands and the literatures with which the authors were conversant, the material is well selected and edited, and evidently for the United States some special effort has been made to make the treatment full and well illustrated, but unavoidable limitations have brought in many imperfections that will always characterize a work of this world-wide scope. None the less, as a book of reference and for consultation it will prove a valuable one in many libraries, public and private.

BOOKS RECEIVED.

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

The Classic Myths in English Literature. Edited by Prof. Charles Mills Gayley. Boston; Ginn & Co. Pages 540; illustrated.

Resources and Development of Mexico. By Hubert Howe Bancroft. San Francisco, Cal.; the Bancroft Publishing Company. Pages 326; illustrated.

Modern Guns and Smokeless Powder. By Arthur Rigg and James Garvie. London, E. & F. N. Spon; and New York, Spon & Chamberlain. Pages 84; illustrated.

Annual Report of the Chief of Engineers, United States Army, 1893. Brig.-Gen. Thomas Lincoln Casey, Chief of Engineers. Washington; Government Printing Office. Pages 544.

Report of the U. S. Inspector of Coal Mines for the Territory of Utah, 1892. Robert Forrester, Inspector. Washington; Government Printing Office. Pamphlet, pages 32; illustrated.

An Elementary Treatise on Theoretical Mechanics: Part I.; Kinematics. By Professor Alexander Ziwet. New York and London; Macmillan & Company. Pages 184; illustrated with diagrams. Price, \$2.25.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.

All letters should be addressed to the MANAGING EDITOR.

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

Rutile.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: In answer to the note in your "Journal" of October 28th, I have to say that there is a market for good crystallized specimens of rutile, but their value depends altogether upon their size and perfect form. The red rutile is used by manufacturers of porcelain teeth for giving color to the gums, and for this there is a call. E.

NEW YORK, Oct. 30, 1893.

Prefers the Silver Standard.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: There is an aspect of the monetary question which, I believe, has not yet had the consideration its importance demands, and on which I should be glad to see intelligent discussion. In the ordinary affairs of life, it would seem that the interest of each individual is to act so as to increase the value of his own property, not that of his neighbor's, to his own detriment. In using gold as money, and still more if used exclusively, we, of course, increase its value by furnishing the additional demand. Whose property is this gold whose value we seem so eager to appreciate? We owe in foreign countries some \$600,000,000 in gold, bearing interest, also payable in gold; that is to say, we owe foreigners about all the gold coin we possess; so that we are actually paying a heavy tax for the privilege of coining and circulating, and thereby appreciating in value the property of others. In a few years the interest will have devoured the principal; and we shall then be in the position of owing what we have already paid; or, rather, much more at its then present value; and what, perhaps, we shall be able to obtain, if at all, only at a ruinous sacrifice. Why not pay our lawful debts, if, indeed, they be lawful, while we still have gold enough to do it with, and use as money the metal that is our own property, and on which we shall not then, at least, have to pay taxes?

Can any one reasonably deny that silver is a better standard of value than gold? Notwithstanding discredit, degradation to a commodity, and, later, consignment to the tender mercies of the professional gambler, an ounce of silver will buy as much of our chief staples to-day as it would in 1873; and in all the fluctuations in the ratio between silver and gold during those 20 years silver alone remained steady in its purchasing power. Experience, therefore, proves what might even a priori be inferred from the manner of production of each, that silver is by far a more stable standard of value than gold.

If, then, as some erroneously contend, their parity at 16 or 15½ to 1 cannot be maintained by the United States alone, under the present system, by which the purchaser—the London market—quotes the price of silver, let us not further stultify ourselves by abandoning the superior standard for the inferior. If we have to compete in the markets of the world with East Indian and other semi-barbarians in silver standard countries, let us, by adopting their standard, at least meet them on equal terms. Let us no longer be taxed in their interest the amount of the discount, so called, or artificial depreciation in the gold exchange-value of silver bullion. Then we shall have no more scares lest gold should leave the country; and, moreover, what gold we shall have will be our own; and increase in its value will mean increase in national wealth, not, as now, increase in national indebtedness and ultimate national impecuniosity.

D. SCULLY.

AUSTIN, Nev., Sept. 8, 1893.

A New Bolivian Mineral.—At the recent meeting of the German Geological Society at Goslar, Professor Steizner, of Freiberg, exhibited specimens of a new mineral from Bolivia, which he had previously described as "Franckel" (Neues Jahrb. f. Min., etc., 1893, Vol. 11, p. 114). It is the "lliceria" of the Bolivian miners, argentiferous galena, which, according to analyses of Prof. Clemens Winkler, consists of a sulpho-salt of tin, antimony and lead. Traces of germanium have been detected in it. The mineral belongs to the same class as plumbo-stannite and kyllindrite.

Water Power Plant for South Africa.—The Pelton Water Wheel Company, San Francisco, has recently prepared an extensive water power plant for the Moodie Gold Mining Company, of the South African Republic, to be erected near Barberton, on the Queen's River. There are a number of mines situated around the station, within a distance of four miles, and the power will be distributed by electrical wires, dynamos and motors. There will be four wheels of 125-H. P., each under a head of 142 ft. The wheels are 72 in. diameter, to run at a speed of 150 revolutions per minute, and are connected by means of rope gearing to the generators.

MINING AT THE COLUMBIAN EXPOSITION.

Specially Reported for the Engineering and Mining Journal.

THE EXHIBIT OF THE GEORGS-MARIEN BERWERKS UND HUTTEN-VEREIN.

The accompanying photograph shows an interesting exhibit made in the Transportation Building at Chicago by Georgs-Marien Bergwerks und Hutten-Verein, of Osnabruck, Germany. A considerable part of this exhibit, including over 60 pieces, is entirely historical and is intended to show the development of railroad track from its first invention up to the present time. It includes a large number of sections of track which have been in service for a considerable time, thus showing by their condition after trial any defects or weaknesses brought out in service, and giving engineers an opportunity to make a valuable study of the results.

The oldest piece of the exhibit, however, is not a railroad, but is a section of a road or plank way discovered some years ago in the northwestern part of Germany, which the investigations of German scholars have proved almost beyond a doubt was built by Domitius, commander of a Roman army, about 100 years before the Christian era. This road, laid over 1,900 years ago, was discovered in marshy ground covered by a mass of peat from 5 to 6 ft. deep. The planks of hewn oak are still in a remarkable state of preservation. The next exhibit, which may be called the oldest real railroad track in existence, is a wooden track dating from the 16th century, which was

built in 1825 by George Stephenson, upon which the first regular trains drawn by steam locomotives were run. It was on a track similar to this that the famous trial was made in which the "Rocket" was victor and was selected for use on the Liverpool & Manchester Railroad.

The collection includes specimens of track from every country in Europe, and also a number from East Indian railroads. Up to the present time, however, American tracks are not properly represented, and one of the objects of the company in sending this exhibit to Chicago was to induce American railroads to contribute to the collection. It is to be hoped that they will do so, since this is the only collection of the kind in Europe, and is much visited and studied by engineers, for whom the addition of American specimens would much increase its interest and value. While we have not space to give a detailed description of all the pieces included in the exhibit, they show in a very striking way the increasing demand for weight and stiffness of rail resulting from heavy traffic and the increasing weight of locomotives and cars and the greater speeds demanded on railroads at the present time. It also shows the difficulty experienced by engineers in finding rail-joints combining all the required qualities and the various devices adopted to overcome this difficulty.

The Georgs-Marien company has made this collection incidentally and to aid in its own work. The company has been for many years engaged in the manufacture of rails, rail fastenings and similar con-

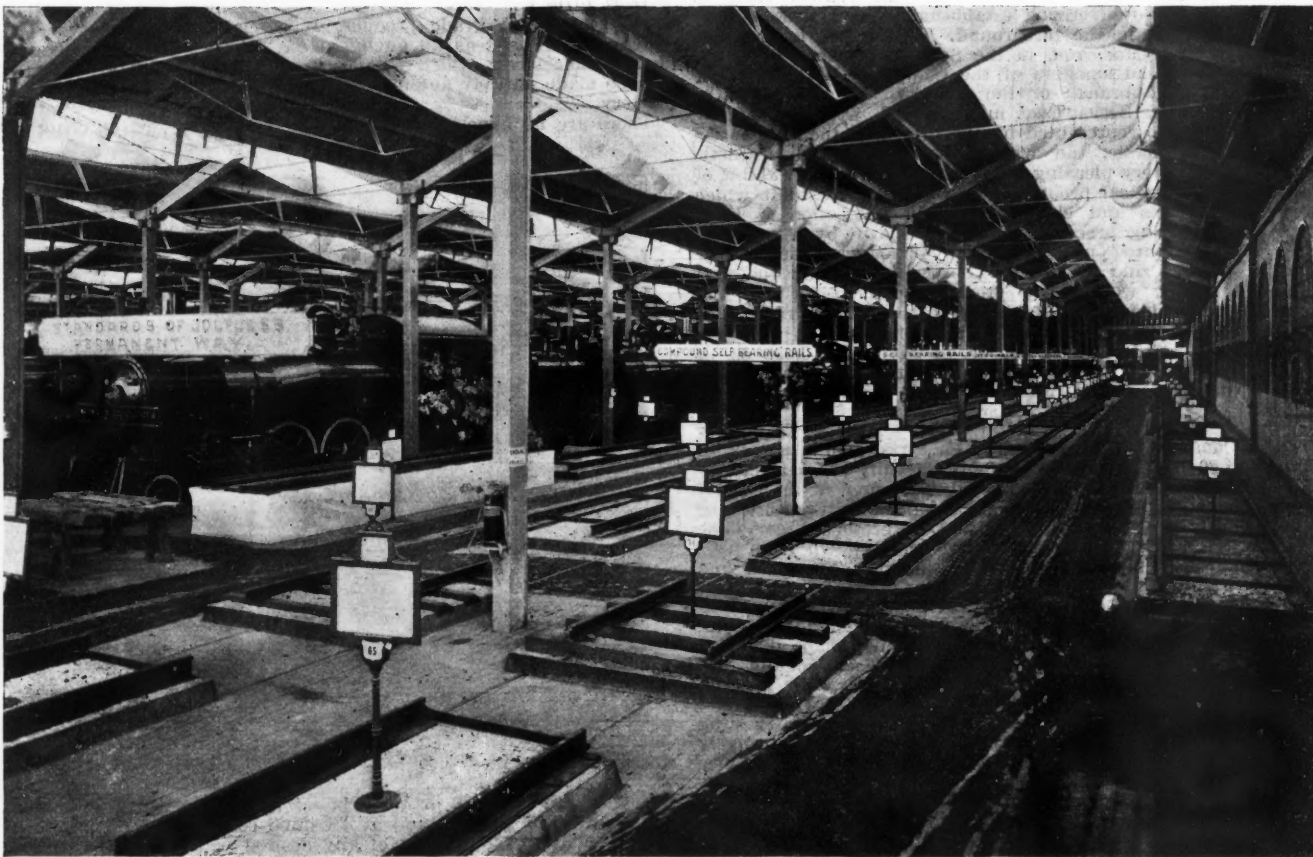


EXHIBIT OF THE GEORGS-MARIEN BERGWERKS UND HUTTEN-VEREIN.

in actual use at the mine of the Apostles, in Transylvania. Wooden tramways of similar construction are still in use in Hungary for mining purposes, and wooden tracks have also been in service for many years in the Harz district in Germany. This system was taken to England by German miners originally in the time of Queen Elizabeth, but in the following century was improved in that country by protecting the wooden rail with plates of wrought or cast iron, for which in the latter part of the 18th century were substituted iron rails resting on wooden sleepers. A section of track shown in this collection, dating from the year 1800, gives an idea of these tramways, which were in use to a considerable extent in English mines long before the steam locomotive was invented. The section shown was brought from Merthyr Tydvil, in South Wales, and it was upon this track that Trevithick made his first trial with a steam locomotive, as recorded in history. Starting from this beginning, the collection gives a representation of the gradual development of the railroad track in Europe up to the present time.

This collection is divided into eight groups with reference to material, form and age of the sleepers used as support for the rail. The first group includes rails laid upon stone sleepers; the second and third rails upon wooden longitudinals secured by wooden cross-ties; the fourth, fifth and sixth, iron cross-ties and iron longitudinals; the seventh system of track with rails of such weight and base as not to be in need of support on sleepers, while the eighth includes track systems which have been approved by experience on modern railroads. Many track sections of historical interest can be seen here; for example, a section from the Stockton & Darlington Railroad,

and has extensive establishments, operating not only the works at and near Osnabruck, but also its own iron ore and coal mines. The iron ore mines are about five miles from Osnabruck, and near the same point are the blast furnaces, foundries and extensive machine shops. The coal mines are at Piesberg, not far distant, while the main works are at Osnabruck itself, and include Bessemer and Siemens-Martin steel plants, forges and hammer shops, rolling mills for tires, rails, ties and similar material; wheel and axle shops, shops for the construction of frogs, switches and crossings; car shops, a large steel casting plant, machine shops and a special factory for the construction of portable railroad for contractors and mining purposes. The company employs altogether about 4,700 people, and for their accommodation owns a tract of 1,343 acres, upon which, besides the various shops, are located 415 dwellings for employees and their families.

The specimens of track exhibited outside of the historical collection include several forms of portable railroad track, and different systems of tracks, rail-joints and sleepers made by the company. The latest is what is called the "Joltless" (Stossfreien) system. This consists of rails of the heaviest section yet constructed—127 lbs. per yard—carried on iron ties, the joints being overlapped and so connected that it is claimed that the stiffness is quite as great as that of the rails itself. It is further claimed that with this joint system so great a strength is secured that the various vexed questions of broken or parallel joints and of suspended or supported joints which have been so much discussed by engineers practically are set aside or superseded. If the joint is really as stiff as the rail itself

the rail becomes continuous, and the position of the joint is really a matter of no importance. This system has been on trial for some time on German railroads with both wooden and iron ties, and has received a severe test at difficult points, including yards, dock lines at Hamburg, Bremen and elsewhere, and several large terminal stations.

THE ROESSLER & HASSLACHER CHEMICAL COMPANY'S EXHIBIT.

The Roessler & Hasslacher Chemical Company, of New York, whose works are at Perth Amboy, N. J., made a striking exhibit of chemical products at the World's Fair in the Mines Building, and also the Liberal Arts and Electrical buildings. The show-cases and booths in which the exhibits were displayed were not the least attractive of the exhibit, and went a long way toward attracting attention. They were chiefly decorated with the company's own manufactured ceramics and colors, thereby displaying their beauty and brilliancy. Big glass cylinders contained cyanide of potassium in large white crystalline lumps of 98 and 99% purity, the kind and quality used in the cyanide process for the treatment of gold ores. Sodium sulphide, hypo-sulphide of soda, prussiate of potassium and a numerous collection of other chemicals used in metallurgical work made up the exhibit, which was the most complete and finest of the kind at the Fair.

The parent house of this concern, the Deutsche Gold und Silber Scheide-Anstalt, vormals Roessler, at Frankfort, had a unique exhibit in the German section of the Mines Building. Well executed models of the company's works and the central office in Frankfort, and of the desilverizing establishment at Hoboken, near Antwerp, are mounted in the foreground. To the left is seen the Mediterranean port of Mazarron, in the Spanish province of Cartagena, with the silver-lead smelters of the Compania Metalurgica de Mazarron, the Spanish branch of the concern. To the right the painting represents the Bergstrasse, in Odenwald, with the quinine factory, Auerbach, also represented by the firm, and the dismantled castle of the same name, the whole combination and aesthetic coloring producing a very pleasing effect and relief to the exhibit of chemicals and metallurgical products. A part of this exhibit which interested metallurgists and chemists was the Roessler & Edelmann's new desilverizing process, which was shown by a series of products. This patented process, which introduces the aid of aluminum in the old zinc desilverizing process, was for the first time exhibited in any world's exposition. A descriptive pamphlet points out its principal merits in saving of time and material. It is in use in the Desilverizing Works at Hoboken, near Antwerp, where about 67,000,000 lbs. of lead, 4,000,000 oz. of silver and 5,000 oz. of gold are yearly produced. These figures give an idea of the size of and extent of the operations of this firm.

THE TANITE COMPANY'S EXHIBIT.

The Tanite Company of Stroudsburg, Pa., has made its exhibit somewhat of an educational character. It is carefully and attractively arranged, and the intention of the company is to present the exhibit entire at the conclusion of the Fair to the Smithsonian Institution or some other public institution where it will be preserved complete. Emery is illustrated fully, specimens of ore being shown from Turkey, Greece and the United States, while sapphire, corundum and emery are shown together in a group with an explanation of their respective constituents and uses. Emery is then shown in its successive stages; first, as it comes from the crusher, then in the form of grain and flour, then as polish, and lastly in the shape of whetstones and solid emery wheels. There are also fragments of different classes of the Tanite wheels arranged so as to show their internal texture, and bottles containing dust gathered under the wheels after grinding cast and wrought iron, steel and brass. Some interesting specimens show what the company calls petrified sparks—strangely shaped cones formed of the matter which fuses below the emery wheel when grinding under heavy pressure. Another exhibit shows comparative products of the emery wheel, the file and the cold chisel, and portions of cast iron and tool steel with the cuts made by file and wheel, showing the respective work done by each. On the same stand are different parts of machines surfaced by an emery planer. Beside the metal specimens are blanks for combs made of vulcanite and finished combs showing how they had been edged and the teeth cut out with Tanite wheels.

In addition to the emery numerous samples of corundum are shown from Ceylon and from our Southern States. To these and some of the emery samples are attached analyses showing their composition. Samples of carbon or black diamonds and also samples of clear or gem diamonds suitable for turning and dressing emery wheels are also shown by the company. An interesting series of photographs shows emery veins and mining processes in Westchester County, New York. There is also an instantaneous photograph, which one might suppose shows the tail of a comet, but which is merely a stream of sparks from the emery wheel while engaged in grinding through a file.

THE SEYMOUR CONCENTRATOR.

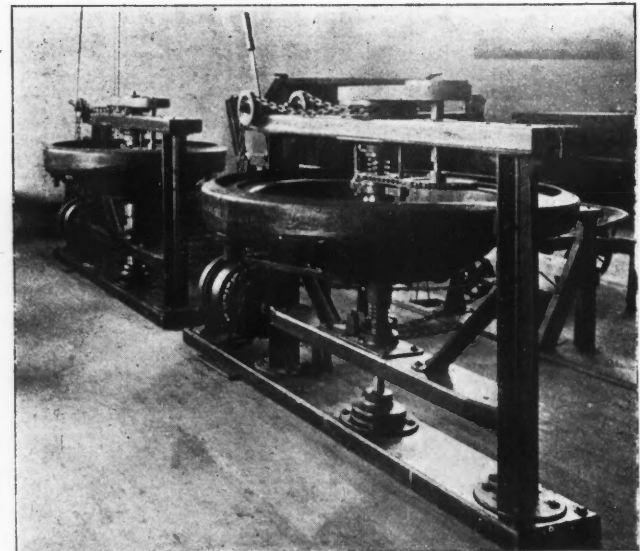
This concentrator, which is shown in the accompanying engraving, is constructed in such a manner as to employ both centrifugal force and the force of gravity at the same time and in unison, and to admit of a broad variation of these forces; it can consequently be adjusted to the conditions of almost any ore to be treated. Where there is only a trifling difference in the specific gravity of the minerals to be saved and the gangue, this difference can be increased by centrifugal force to a point where they will separate readily. In order to make a high grade concentrated product the ore must be pulverized to a sufficient degree to free the mineral or metal from the particles of quartz or ore so that a separation is possible. The fineness of pulverization depends, of course, on the character and fineness of the minerals, and may vary from 40 to 80 mesh.

To illustrate the action of the machine, its work on ores where

gold is in a flaky state may be described. The pan is supplied with crushed ore through a pipe or launder, the ore being delivered to and against the inner wall of the pan, which is the point where the separation takes place, the lighter material being discharged over the top of the pan and into the inner annular trough, which surrounds the pan. The feed is continued until there is a sufficient amount of concentrates collected to require discharge. The pan is then raised, the speed increased, and the concentrator discharged centrifugally into the outside annular trough. Any flaky particles in the ore, it is claimed, lay in their rise centrifugally with their flat surface against the pan and parallel to the wall of the pan, and when they receive the vertical or end thrust they are thrown downward edgewise; while on a practically horizontal table the inclination is to sail away by the action of the water.

The continual vibration and movement of the pan is transmitted to the ore, keeping it in constant motion and preventing packing. The nearer the specific gravity of the mineral and the gangue are, the greater the agitating action should be, and the more powerful is the centrifugal force that can be applied by the increased rapidity of revolution of the pan without causing it to pack on the wall of the pan, and prevent a free separation of the different materials. The inventor claims that it is particularly adapted to ores in which the mineral is extremely fine, and is so distributed that the ore must be thoroughly slimed to free the minerals; for gold ores where the gold is flaky and fine; for the separation of concentrated sulphides carrying gold, throwing away the iron which is high in sulphur and carries little gold value, and retaining the more valuable particles, making a higher grade product. It is claimed also that the machine can be used as an amalgamator, and will catch amalgam or floured suicksilver which escapes from the batteries or plates. It can be made entirely automatic in its working in connection with a battery.

There are no expensive wearing parts, the only parts being sub-



THE SEYMOUR CONCENTRATOR.

jected to any amount of wear being the cams, which can be replaced in a few minutes and at a trifling cost.

The machine can be built of any desired capacity up to 100 tons per day. Other advantages claimed are that it is simple and easily adjusted and can be operated by any one familiar with concentration. It is light and easily transported, there being no piece in the machine weighing over 60 lbs. It has been subjected to some severe tests in practice. The quantity of water required is much less than that used by gravity tables, where the whole action is produced by the flow of water. It does not require clear water, and will use the water over and over, as the gangue is thrown off centrifugally and the water used is more as an agent to hold the material in suspension.

It is patented by the inventor, Charles E. Seymour, in all the principal gold producing countries in the world, and is made by the Seymour Concentrator Company, Chicago, the factory being at Lake Geneva, Wis.

ATTENDANCE AT THE EXPOSITION.

The total paid attendance at the World's Fair from the opening day and including when the Fair was formally closed was 21,458,910, divided as follows: May, 1,050,037; June, 2,675,113; July, 2,760,263; August, 3,515,498; September, 4,638,902; October, 6,799,102. The total admissions on passes, including the employees of all kinds, exhibitors, concessionaires, etc., has been 5,953,818. The last admissions reached a total of 242,575, of which 208,173 were paid. The gate receipts will approximate \$10,500,000, and the concession receipts \$4,000,000. The Fair has received about \$2,500,000 from souvenir coins and premiums, and receipts from various sources, added to the \$10,000,000 capital stock, make the total receipts approximately \$28,400,000. The buildings, grounds, administration, and everything else under the direct jurisdiction of the exhibition officials cost about \$25,000,000. The grounds will continue open as long as the managers deem best, but the dismantling will begin at once.

SOME NOTES ON THE GEOLOGY OF ARIZONA.

Written for the Engineering and Mining Journal by John F. Blandy.

On the geological map of the United States the geology of the southwestern part of Arizona is represented by two colors—the one showing the primary or granite fields and the other the diluvium, the latter being the prominent feature. True, the first-named color is shown in two shades, one representing the granites, and the second shade is meant to indicate the formations from the granite up to the Silurian. The principal fields included in this second shade are, first, the one which covers the east side of the Bradshaw Range, reaching from about Gillette on the Lower Agua Frio northward to the head of the Agua Frio Valley, and still farther north it lies along the western foot of the Black Hills. The eastern boundary of the field is fairly a straight line, but the western boundary is as irregular and waving as the rise and fall of the mountainside upon which it lies. A second field is that which extends northward from the Granite Mountain, and a third conspicuous one extends westward from the Hassayampa River through the Vulture mining district toward the Harqua Hala Range. There are, as may be expected, many small patches to be found, either within the mountain ranges, as at the head of Humbug Creek, or exposed around the edges of the granite fields, but they are too small to find place on a map of so small a scale as the one mentioned.

By a more extended examination we find that the Silurian color can be added to represent the narrow field of those rocks which overlie the last mentioned in the Agua Frio Valley, and extending northward from about Gillette to the Upper Agua Frio. They consist mostly of silicious slates. I have not been able to find this formation in any other locality. During the past 18 months I have, however, been much interested in tracing another formation, viz., the Triassic, which no doubt covers much of the territory that has been marked as Diluvium.

The outline of this formation in northeastern Arizona has been very carefully traced and is well known, but I am not aware that its existence in the Gila Valley or Southern Arizona has been mentioned. I first encountered it in small patches of a few acres each in the Upper Agua Frio Valley, about Big Bug Creek on the west and Ash Creek on the east. These patches consisted altogether of soft sandstones, calcareous shales (sometimes true limes), and slightly indurated muds or shales. Farther down the Agua Frio, about Gillette, the beds are harder, and beds of white chert are seen. My next encounter with this formation was on the west side of the Bradshaw Range, in the Skull and Hassayampa valleys, where it is quite extensive. High upon the granite mountains between Minnehaha Flat and the Hassayampa are to be seen two small patches which are peculiar. These isolated pieces of a strange formation lying in the valleys on the east and west sides of the Bradshaw Range had been known to me for some time before I could determine to what they belonged.

A trip across the Gallurio Mountain from the San Pedro River, in Pinal County, to the Aravaipa Valley, in Graham County, and from the Aravaipa Canyon northward to the San Carlos coal field, proved to me the existence of the Triassic formation in the Gila Valley. It then only needed a journey westward to trace the same formation from place to place at least to Yuma County and into the valley of the Colorado River.

There cannot be a doubt about the San Carlos coalbeds being in the carboniferous formation, and not the cretaceous, as the coalbeds of northeastern Arizona. These beds, or rocks, dip deeply to the south, and the coal is not known again until we enter Sonora, although the stratified rocks about Tombstone and Bisbee have been pronounced carboniferous, also the limestones of the Santa Catalina the Rincon mountains north of Tucson. Going southward from the San Carlos coalfield to the Aravaipa Canyon and Gallurio Mountains, we come upon the nearly horizontal sandstone beds of the Triassic. The purple shales near the head of Aravaipa Valley would seem to indicate the presence of the Permian also.

Going eastward we encounter detachments of the cretaceous formation before reaching the New Mexico line, and in the valley of the San Pedro about Benson, and south of that is a formation which seems to be Tertiary. This is unconformable with the formations to the west and north of it.

At Tucson we are upon the Triassic again, the formation resembling the places where the Agua Frio, the Castle Creek and the Hassayampa River debouch from the hill country into the flat country of the Gila Valley.

As yet I have not been able to get a section of the formation, and therefore upon encountering it at any point am unable to determine the position in the formation, whether the top, middle or bottom.

At Frog Tanks, where the Agua Frio enters the flat or desert country, we have a section of over 300 ft. from the river beds to the top of the flat. Some feet of this at the top resemble the formation about Tucson. Below we have a succession of sandstones to the river bed, the lower bed being almost destitute for many feet of bedding planes. At this point the bedding is almost or quite horizontal, extending toward the south. Starting northward from this point we immediately enter the hill country, and find the stratified rocks much disturbed and only the sandstone visible. As we pass on up Castle Creek we meet with enormous masses of what I would call boulder sandstone tilted in every direction, but mostly dipping toward the east. These masses form the box-canyons of Castle Creek up to Buzzard Roost, a distance of 25 miles. This, I am of the opinion, is the bottom layer of the formation, but I do not think it is continuous, as I have seen it in but one other place, north of the Gila River, about a mile from Riverside. It was there I first saw it, and suppose that the narrow valley had once been a lake at that point, and, after having been filled by river boulders, gravel and sand, had been subsequently cut away, leaving these boulder bluffs. The evidence at Castle Creek leads to a different conclusion, and that it is the bottom layer of a formation. That a great upheaval has taken place of the granite

mountains subsequent to the Triassic age is here evidenced, as the horizontal layers at Frog Tanks are about 1,500 ft. above tide, while north of that we can see some of the remnants of the formation lying in a tilted position at points from 4,000 to 5,000 ft. above tide.

Going northward from Buzzard Roost we find a slab of this formation, with a dip to the north of nearly 40°, lying on the steep mountain side a short distance south of Goodwin's Station. These are thin-bedded sandstones. Again, near the head of Oak Creek, on the north side, and a short distance west of Minnehaha Flat, we see an enormous mass of the boulder sandstone, more than 100 ft. high and covering some acres, lying in a granite field.

We next encounter it just north of the dam on the Hassayampa as a heavy sandstone, and it seems to be almost continuous from there to the head of Skull Valley, a distance of over 20 miles. In Skull Valley it is much disturbed, and in places covered over with beds of lava. It covers quite an area—many square miles—on the east side of the Hassayampa, reaching from Minnehaha Creek to Oro Fino, and extending up the valleys of Blind Indian, Milk and Slate creeks eastward to the foothills of Mount Union.

The parts of the formation reaching up these valleys are the thinner and softer layers that are above the massive sandstones formerly mentioned. Conspicuous among them is an indurated bed of white clay, which approaches very nearly in appearance to kaolin. It is an excellent material for the construction of fireplaces and chimneys, as it can be sawed with a common handsaw and resists the fire better than ordinary brick. It has been tried for assay furnaces, but could not withstand a great heat. The whiteness of the water during storms from passing over this bed has given the name "Milk" to one of the creeks of this basin. How far north of Skull Valley the formation can be traced I am yet unable to say.

Going westward in the plain country we can next see it on the Hassayampa below Wickenburg, and north of Wickenburg along Martinez Creek. From this place we are thrown more to the northwest in our search, and encounter it again high up in the Tres Alamos Mountain. Northwest from that we reach the Santa Maria River, whose course is southwest and west to its intersection with the Big Sandy. The south bank of this stream is bounded by bluffs and benches of the sandstones of this formation, and many patches exist on the north side. About six miles below the mouth of the Santa Maria the Big Sandy enters Stripped Canyon, so called from the crimped beds of dioritic gneiss through which it is cut. The mountain mass on the northwest and southeast sides of this canyon is diorite, and the Triassic rocks lie horizontally around the southeastern base. To the north of the canyon and on the west side of the Big Sandy we see the sandstones in Pope's Wash and toward Artillery Peak, with a slight dip toward the southeast. But at Artillery Peak, and for some miles around it, it is much disturbed, also some high bluffs on the east side and around the mouth of the Santa Maria. A short distance north of the mouth of the river is a fine bluff of sandstone, with a dyke of lava passing irregularly up through it and spread out over the top.

Passing up the Big Sandy to Signal Sound detached masses can be seen high up on the mountains on the east side. Between the mountains which lie on the west side of the Big Sandy and the Chemiwevis Mountains is an extensive open basin country extending south nearly to the Bill Williams Fork, which is underlaid by Triassic rocks. These extend as far north as the south end of the Black Range. Whether they can be traced farther up the Colorado Valley or not I am unable to say, not having been farther north than the Atlantic & Pacific Railroad.

To return now to the plain country of the Gila Valley. We find that on the north edge of this plain the strata are horizontal, extending toward the southward, but that toward the northward all has been disturbed by the elevation of the mountains. Going southward over the Gila Valley and toward the Sonora line we find the plain diversified with a unique mountain system. Ridge after ridge, each of a few miles in length, rise directly from the plain without any foothills. This mountain system extends from a short distance west of Tucson westward to the Colorado River. Of what the ridges consist I am unable to say. Some of them, I know, are granite, and I have been told that at least one, lying south of Casa Granda, is of Devonian lime and sandstones. In seeking an explanation of this unique mountain system we are inclined to speculate, and my theory would be as follows:

We have seen that a great subsidence of Southern Arizona took place after the carboniferous period. At what geological period later than the carboniferous we do not yet know. In Northern Arizona I am not aware that any rocks have been found between the carboniferous and Permian, but that does not prove that they may not have existed in Southern Arizona. This subsidence was so great as to leave the mountain ridges as islands in a shallow sea, which was subsequently filled up in the Triassic age. If this idea is correct, then we may expect to find that a large area of the level lands of Southwest Arizona is underlaid by Triassic formation, and afterward buried to such an extent by debris as to be marked as diluvium. Wherever we have found this formation around the edges of the plain we find them horizontal, and can infer that they extend under the whole valley.

What I have taken for the bottom strata of this formation I have called a "boulder" sandstone. It is in places as much as 100 ft. thick and shows no bedding planes. The mass is sand, varying from very light to dark red, and filled with boulders varying in size from a few pounds to some hundreds of pounds in weight. In places the boulders are much rounded and in others quite angular. I do not believe this bed to be continuous like the overlying sandstones, but it is conspicuous upon Castle Creek and near Riverside on the Gila River. In places around the Bradshaw Range I have seen collections or deposits of boulders of various rocks so extensive as to suggest a glacial deposit, as in Northern Wisconsin and Michigan, but the absence of moraine and scratches would not confirm that idea, and I am now of the opinion that the destruction of this boulder sandstone is the

origin of the boulder deposits; that the remaining patches of Triassic rocks found over such an extensive area is a proof of the immense amount of material that has been worn away and carried on to the southern plain.

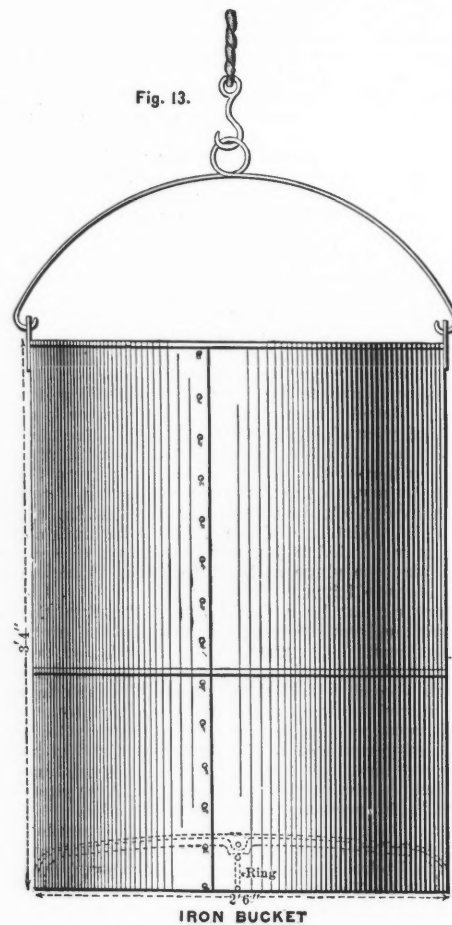
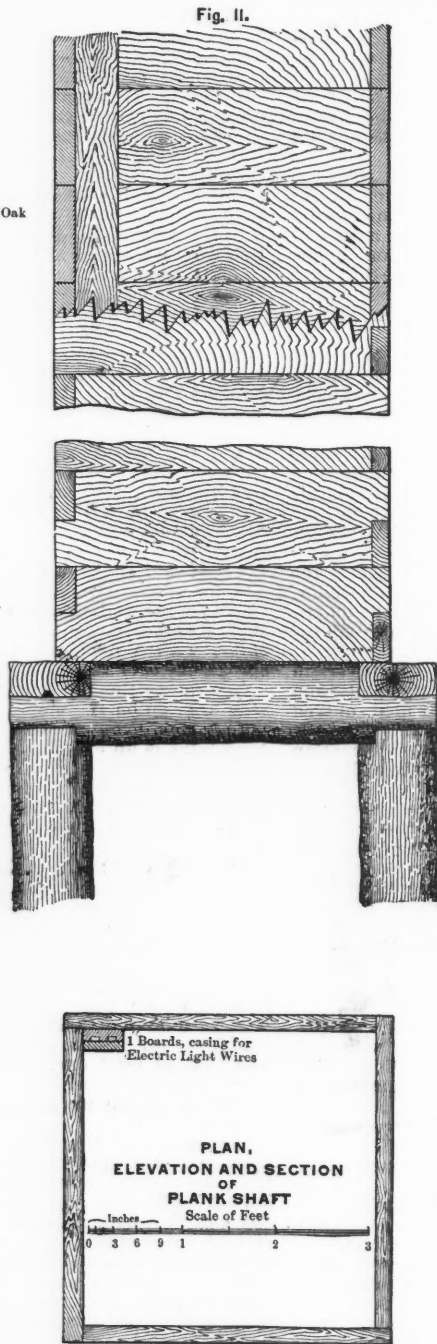
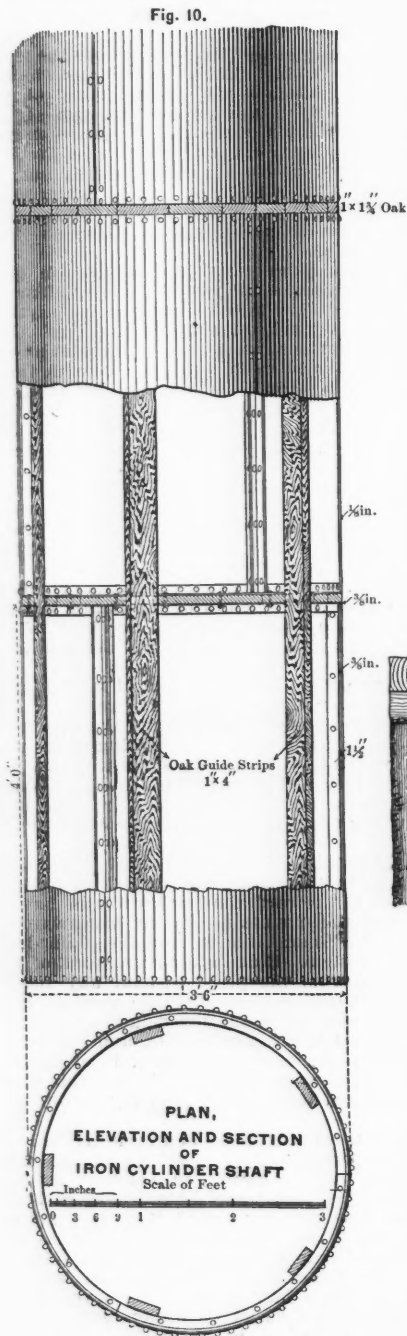
In the foregoing I have not attempted to give any detailed description of the stratification of this formation, but only to line out roughly the area which has been covered by it, a full description requiring closer investigation and the assistance of others.

SHAFT SINKING AND TIMBERING AT THE BERTHA ZINC MINES, VIRGINIA.

By William H. Case.

The method of mining first pursued at Bertha was the usual one practiced in the district in mining limonite-ores in clay, known as

derricks. The occasional filling of the pits with rainwater, mud and sliding clay, was a drawback to this system of mining, as were also the interruptions to a steady output by stormy or inclement weather, and the occasional intervention of barren areas of ground that had to be excavated before ore was again reached, and the blasting and removal of many chimneys. As the depth of the stripping was increased by advancing into the slopes of the hills, the proportion of "deads" to ore was also largely increased, and the cost, as well as the difficulties, assumed serious proportions. To obviate these difficulties, but mainly to secure a steady and sufficient output for the furnaces, as well as to lessen the costs, the underground system of extraction was started in the fall of 1889. The hills were entered by timbered drifts in clay from the previous outside working-level, and the tram tracks were continued in them from the outside. When the limestone chimneys were encountered, the drifts followed their contour, where practicable, and where it was not practicable to do so and preserve the



SHAFT SINKING AT THE BERTHA ZINC MINES.

"open-cut" mining; with the difference that in digging iron-ore, the dirt or clay is only occasionally stripped or separated from the ore-bearing zones and put in spoil-banks as "deads"; generally it is dug with the ore and goes with it to the washer; whereas, in open-cut mining for zinc, the inclosing clay is first removed as "deads" to spoil-banks, and the zinc-ore bodies are then dug and sent to the washer, the process becoming one of "stripping." While this process was confined to the low ground, and to the slopes of the hills, where the clay covering was comparatively light, the ore was quite easily won, the chief difficulties occurring only in excavating the deep cavities between the chimneys, below the working or hauling-level; in such places the material was at first cast up in stages, sometimes from depths of from 30 to 40 ft., and later it was hoisted out by steam

necessary alignment for tracks the limestone was cut into as much as necessary, and the chimney was encircled with a timbered barrow drift to win the ore. A second timbered drift was run upon the one below, and thus, one after another, drifts were carried around and over the chimney, all the drifts above the lower one holding the "deads." The ore was milled through chutes, or passageways, to cars or barrows in the bottom drift. Where the thickness of the ore-bodies exceeded the width of the drift, additional drifts were carried outside the first, until the limiting clay was reached and all the ore extracted. The ore below the working level was extracted by sinking and timbering a small shaft, similar to a winze, near the chimney till the bottom of the cavity or depression was reached; timbered drifts were then carried around the cavity, similar to the upper timbering, and the ore was hoisted by windlass through the shaft or winze.

Later, the set timbering around and over chimneys was modified, especially where the ore was less than 3 ft. thick; in such cases a

* Abstract from paper read before the Mining Section of the Engineering Congress in Chicago. See also "Engineering and Mining Journal" for September 16th, 1893, page 292.

small timbered raise was made to the top of the chimney, and the ore was removed from the top first, thence the excavation was carried down the sides in sections, the clay being temporarily supported by head-pieces of slabs or lagging, held by a small timber strut, in a species of mining by withdrawing. The main drifts were strongly timbered, in order to keep them open as long as needed, while all other drifts were allowed to collapse, which they did some weeks or months after the ore had been exhausted, by the gradual but persistent squeeze of the tenacious clay. The chief difficulties encountered in this system of drift-mining without machinery were the eventual long tramping, as the work progressed, necessitating considerable retimbering of main drifts, and the occasional poor ventilation of the shafts or winzes. As the work could be conducted steadily in all kinds of weather, and as costs were favorable, the results were encouraging. In the meanwhile, the sinking of some test-shafts from the surface to the limestone, on a distant portion of the tract, suggested their utilization for exploiting the ore. By a studied arrangement, they might be sunk to the lowest depressions in the underlying limestone, and thus serve to overcome the principal difficulties that had been encountered in drift-mining.

These test-shafts are circular, and had an average diameter of 3½ ft. With a pick and a shovel fitted with special short handles, and a bucket to suit, a miner, with his anatomy disposed in the shaft so that his legs form the vertical, and his spine the horizontal limb of a right-angled

cheap lumber and convenience it was found very satisfactory to make linings of 2-in. oak plank, the circular shaft being squared to 3½-ft. sides, and lined with a set made from a 14-ft. plank cut into four equal lengths, the ends framed by simply halving or boxing, as shown in Fig. 11. The lining of the shafts by contract, including the squaring and hoisting, costs 25 cts. per foot, and the plank 42 cts. per foot, making the total cost of sinking and lining shafts 89 cts. per linear foot. The lining planks are reclaimed when a shaft is abandoned, and are used a second and sometimes a third time.

In the pipe-shaft system of mining the drifts are of smaller section and less expensive. The posts are spaced 3½ ft. apart on the sill and 2½ ft. on the cap. The general level of the drifts is the level of the rims of depression between chimneys. As they follow the limestone laterally they are very crooked. Special deep barrows, made of boards, are used in these drifts, the wheeling limit rarely exceeding 100 ft. No limestone is cut in this system of mining. The average depth of working shafts is 90 ft., and the greatest depth of any shaft thus far is 125 ft. The system of timbering, aside from the main drifts, is shown in Figs. 12 and 14. The ventilation is good, except near the top of those chimneys having no ladder shafts to the surface; but this can usually be regulated by a little bratticing. Incandescent electric lights, now being put in, will improve the ventilation.

In the shaft system portable light hoists and boilers are used, mounted on a heavy timber frame; each hoist works two drums. A sin-

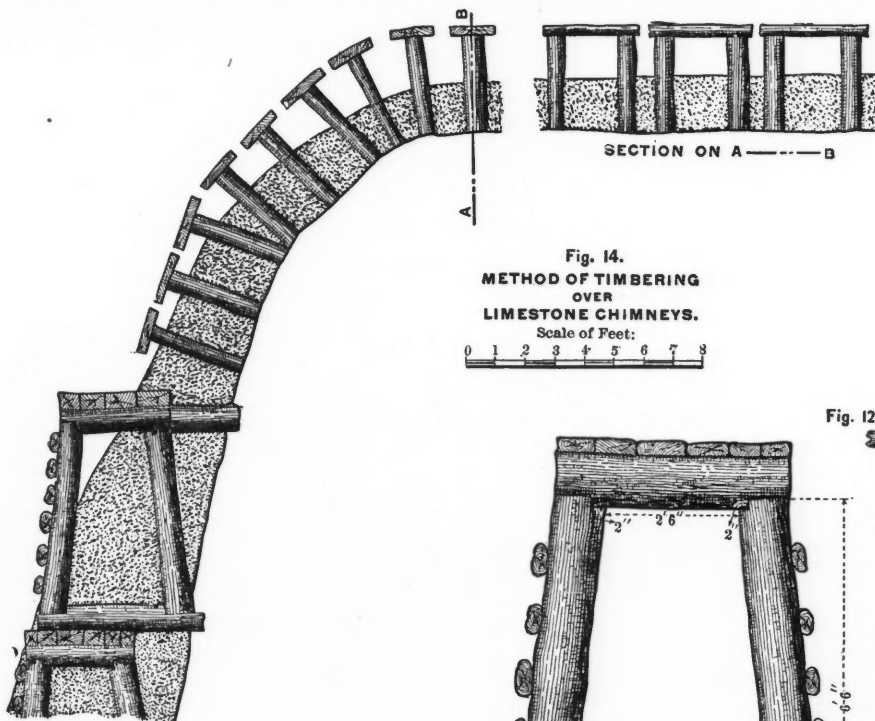


Fig. 14.
METHOD OF TIMBERING
OVER
LIMESTONE CHIMNEYS.

Scale of Feet:
0 1 2 3 4 5 6 7 8

DRIFT TIMBERING AT THE BERTHA ZINC MINES.

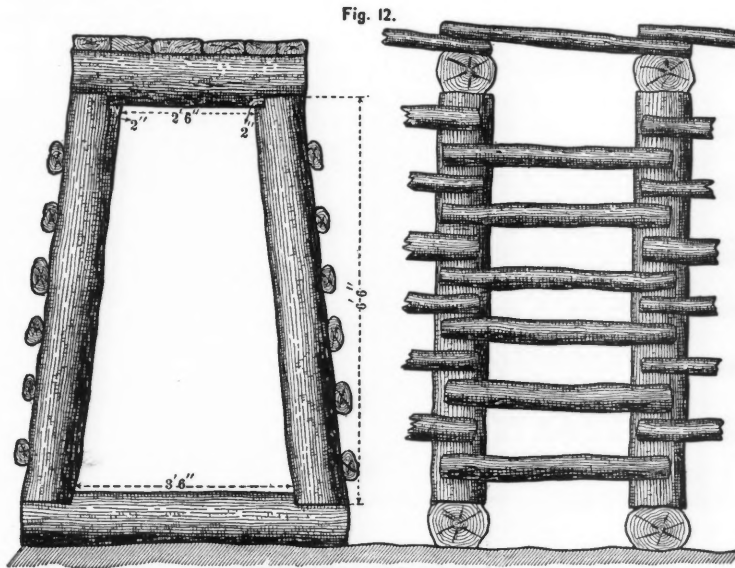


Fig. 12.

DETAIL OF DRIFT TIMBERING

Scale of Feet:
0 1/2 1 2 3 4

triangle, can, with his helper operating a primitive windlass at top, sink a shaft 3½ ft. in diameter to depths of 100 ft. and more for 22 cts. per linear foot. The application of these shafts to mining Bertha zinc-ores seemed perfectly feasible by using a removable, cheap lining to preserve the form of the shaft, and by directing the shaft location by means of underground exploring drifts and simple surveys, so that they should be sunk in each one of the principal basins or cavities that occurred between the limestone chimneys. This system, named from the form and diminutive appearance of the linings the "pipe-shaft" system, was introduced in the summer of 1890, and since that time has successfully furnished all the ore required to fully supply ten Welsh-Belgian furnaces of 140 retorts each, working at Pulaski exclusively on Bertha ore. The iron shaft-linings used are shown in detail in Fig. 10, and require but little explanation. Where the clay stands intact, as is usual till the shaft reaches limestone, and its correct location is thus proved or established, the segments for each section are lowered one by one and bolted together in place, or, if the clay is inclined to flake and fall, the sections may be completed at the top and lowered as required, thus protecting the miner from falls of clay, and following the excavation as it progresses. As the first cost of these linings is somewhat great, being \$4 per linear foot at Bertha, although they can be used many times, and the cost chargeable to each shaft is thus reduced, only enough lining for three shafts was at first used, and this lining has been continued in satisfactory use, especially in weak ground and at temporary shafts. On account of

gle brakeman attends to the two drums and the boiler, and a single lander is at each shaft.

Steel buckets, 30 in. in diameter and 40 in. deep, are used, holding 1,300 to 1,500 lbs. of ore. A simple tripod of heavy poles, 35 ft. long, or a bolted frame of squared timbers, built in a portable form, is used for the pit-head frame. The buckets are inverted by a gallow-rope or chain, which carries a hook at one end to engage with a ring in the bottom of the bucket, and dump directly into tram-cars. The system is intended to be easily portable and elastic and adapted to unevenly settling ground. As fast as the workings progress, surveys are made with a hanging compass and are mapped. These surveys show just what ground has been exhausted, and where to locate shafts on the surface. The extension of the timbered workings from one shaft to the point where they meet the timbered workings of neighboring shafts, proves that all the limestone has been uncovered between the shafts, and with competent supervision it proves also that the ore in that section has all been extracted.

Chromium Steel.—This was first introduced at the works of John Brown & Co., Limited, in England, about 1876. At that time, however, the amount of chromium used was very small, but as time went on the alloys were made richer and richer. When the Tasmanian iron appeared with about 8% chromium it was considered very rich indeed, but nowadays much higher percentages are used.

A LARGE ELECTRIC LOCOMOTIVE.

The accompanying illustrations, for which we are indebted to the courtesy of the "Electrical Engineer," show the heaviest and most powerful electrical locomotive yet built, which is now nearly completed. It was designed by Messrs. Sprague, Duncan & Hutchinson, and is being built under their supervision to the order of the North American Company. The work has been done at different establishments, the running-gear and cab and most of the furnishing and assembling being done at the Baldwin Locomotive Works in Philadelphia. Fig. 1 shows a general elevation of the engine; Fig. 2 a plan; Fig. 3 a section showing the frame, journal-boxes and field-magnet castings, and Fig. 4 one half an end elevation and the other half a section through one of the driving wheels.

This machine is intended for special experimental work in handling heavy freight trains and in switching, and is therefore built for slow speed and heavy traction. The entire weight, as will be seen from the engravings is carried upon four pairs of wheels, all of which are driving wheels. The frame is a heavy steel forging with deep pedestals, and is arranged to receive driving boxes, fitted with the

directness of application, the impossibility of operating two or more motors in series satisfactorily on a slippery track when the full tractive effort is required of them without a mechanical coupling, and the likelihood that with large wheels each flexibly connected to the system the trouble anticipated from the impact on the rail would not be as serious as is generally supposed.

The motors, four in number, and alternating in position, are of the "Continental" ironclad type, the field magnets being formed of two steel castings, and having two field coils placed at the ends of the motors with their planes vertical, thus forming two consequent and two salient poles. The magnets are compound wound, the shunt field being light and only sufficient to keep the speed within reasonable limits at light loads and for returning current to the line when running on down grades. The armatures, which were built by the Westinghouse Electric and Manufacturing Company, are of the slotted type, the slots having curved bottoms and tops and contracted gaps. Each slot carries four wires, but there is only one turn of wire to each bar of the commutator, and the wires are threaded through tubes imbedded in the slots. The winding is of the two-path type, giving the current only two paths in the armature. Its

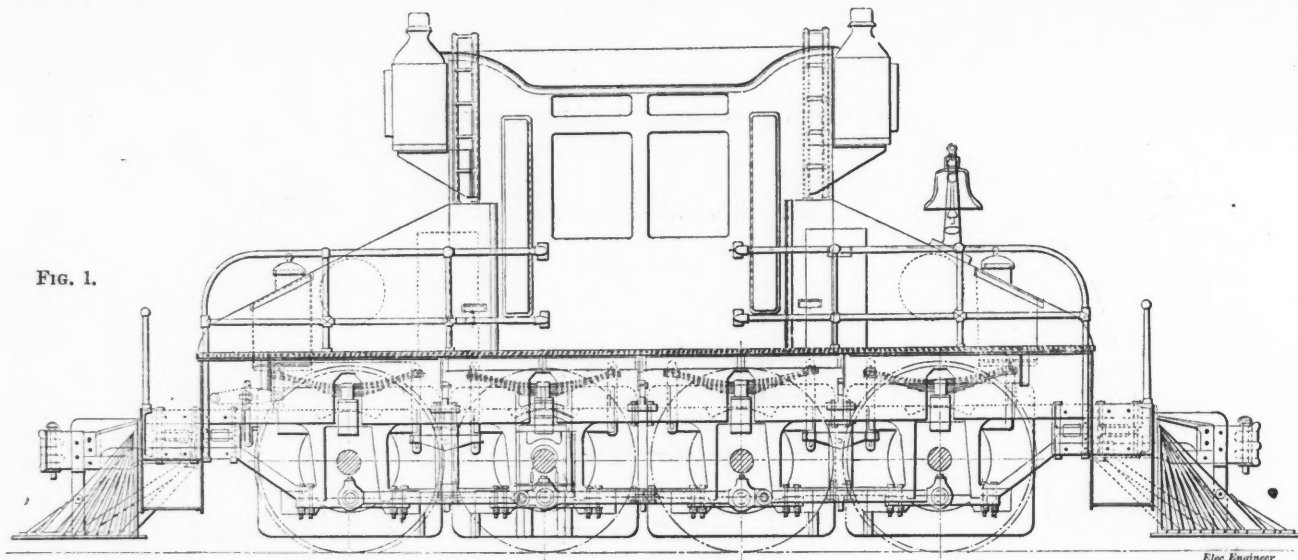


FIG. 1.

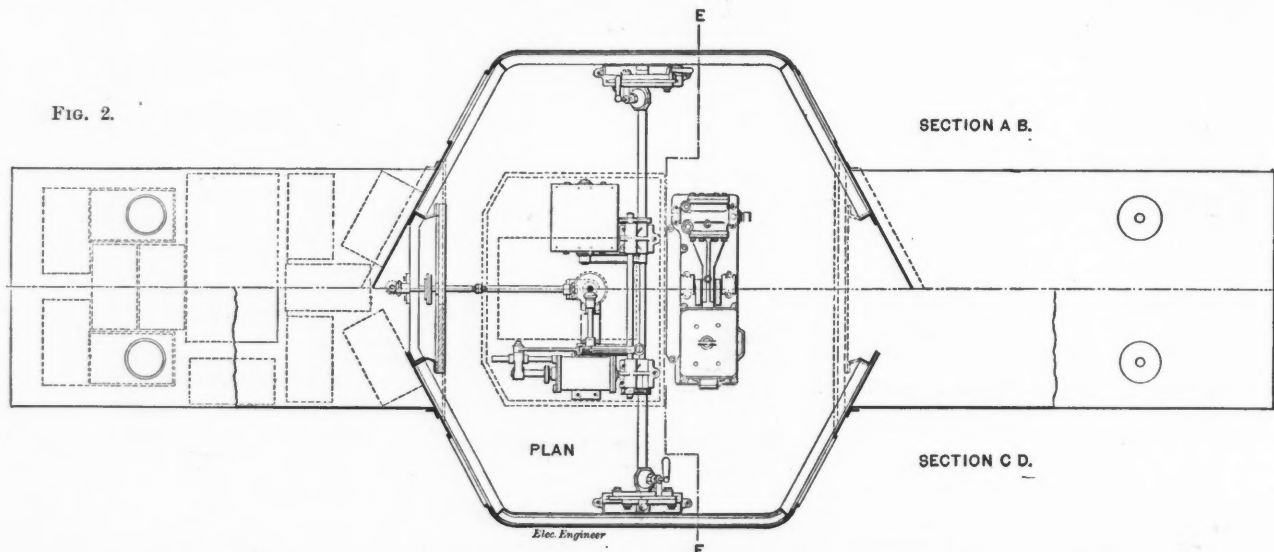


FIG. 2.

THE SPRAGUE ELECTRIC LOCOMOTIVE.

usual wedge and key adjustment, similar to those employed in the consolidation type of steam locomotive. The journal-boxes, however, are of special form; they are made of cast steel and project inward to form brackets which carry the motor. They are therefore made very heavy, as they have to perform the double service of carrying the axle upon which the armatures are rigidly mounted and the field magnets concentric to them. A stirrup projects from the upper portion of each to carry the middle section of the inverted elliptic springs which are arranged with equalizers, as shown, in very much the same way as on an ordinary steam locomotive with the same number of wheels. The drivers are 56 in. in diameter, the tires on the two inside pairs having no flanges. As will be seen, they are very close together, the total wheel-base being only 15 ft. All the wheels are connected by parallel rods. The weight of the armature is carried directly by the wheels, while that of the field-magnet rests on the journals through the pedestal boxes. There is no spring support of any kind provided for any part of the motors, their entire weight coming upon the track without the intervention of springs, which is somewhat contrary to the prevailing opinion of what is necessary in a machine of this type. The considerations which governed the designers in adopting this plan were the simplicity and

dimensions are: Diameter, 31 in.; length of active parts, 21 in.; number of armature coils, 237. The height of the steel casting over all is 46 in., and the clearance from the top of the rail, 5 in. The induction in the teeth of the armature is very high, being about 22,000 C. G. S. lines.

The motors are wound for 800 volts at 225 revolutions, this being the equivalent of 35 miles an hour when in multiple. They will safely carry 250 amperes of current, giving each motor about 250 H. P. output at 93% efficiency, and in emergencies can easily stand a great deal more than this. The motors will readily exert a drawbar pull of over 30,000 lbs., and have a system of regulation giving any speed from zero to 35 miles an hour under full normal tractive effort. They can, of course, start very heavy loads and have ample capacity to slip the wheels. The regulation is of the series parallel system with resistance thrown into, then cut out of circuit, then again into circuit while changing. The groups are, first, all in series with and without variable resistance, then two in parallel by two in series, then four in parallel, with similar use of rheostat. The four motors are used all the time, there being no position in which one alone is cut out, not even in changing over. These various changes are effected by means of a large contact cylinder on which the three

main combinations are made, and a fireproof rheostat system with the contact arm geared in the proper ratio to the main cylinder.

To effect the prompt operation of this controlling system, which can be moved slowly by hand, air pressure from the same tanks that supply the air brakes is employed. This is automatically kept at a constant pressure by a special electric pump. It was deemed essential that it should be unnecessary for the engineman to watch indicators or gauges of any kind in order to know on what switch position he was running, and to this end the air valve which he controls is mounted on a small lever so geared as to move back and forth as the main cylinder revolves. His hand is thus carried along so that he knows intuitively the position of the cylinder, and has no reason, ordinarily, to use his eyes and ears for purposes inside the cab. There is a reversing switch which is automatically locked in all but the "off" position on the main cylinder, thus preventing reversal under wrong conditions. There are ammeters, voltmeters, a whistle, bell, headlights and the usual accessories. The system of brakes is that known as the "American," and is applied to every wheel. The controlling apparatus is all carried in the cab, which is centrally mounted, has wedge-shaped ends and forward inclined sections running down to each end of the locomotive. The cab is heavily framed so as to carry two trolleys. The ends are narrowed and hand rails flank it on either side.

The cab is provided with seats on either side, and the controlling apparatus is so arranged that the engineman sits at the right side looking forward, no matter which way he is normally running, and has similar hand movement. Steps give access to the pilot platforms at either end, and ladders to the top of the cab. The total

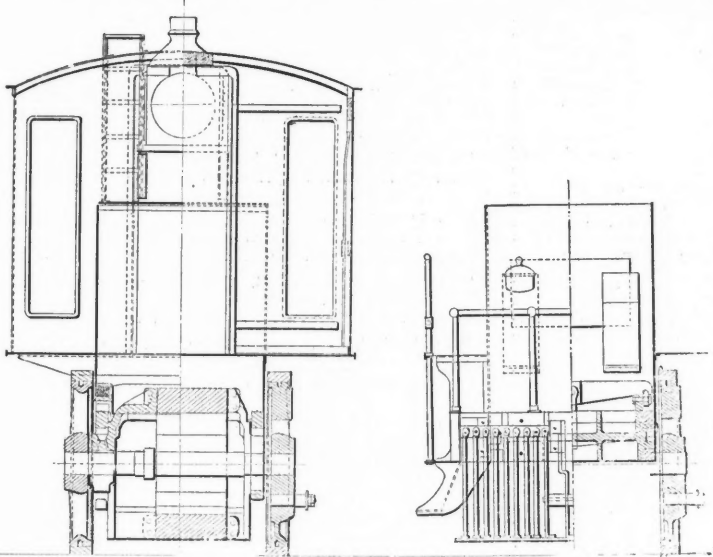


FIG. 3.

FIG. 4.

weight of the locomotive will be about 120,000 lbs., equally distributed on the drivers, and it is by far the largest yet built.

Belgian Coal Exports.—The exports of coal from Belgium in the first seven months of this year amounted to 2,350,294 tons, as compared with 2,298,360 tons in the corresponding period of 1892. In these totals the exports to France figured for 1,846,515 tons and 1,936,368 tons respectively. The shipments of Belgian coal to England in the first seven months of this year figured for 53,204 tons, as compared with 35,920 tons in the corresponding period of 1892.

Big Guns.—The latest number of the "Naval Intelligence Annual," issued by the Navy Department, notes that the advocates of very large guns, who have been strongest with the British and Italian governments, are losing ground. It is noticeable that the heaviest guns to be mounted on three British battleships included in the new building programme are of 12-in. calibre. According to recent reports no more guns of over 50 tons weight are to be built for British vessels, as modern guns of this size are considered capable of penetrating any armor likely to be encountered.

Colonel De Bange expresses the opinion that the largest gun to be mounted on board ship should be a 12.6-in., weighing from 50 to 60 tons, and employing an initial velocity between 1,640 and 1,968 ft. per second.

The Austrian naval authorities have decided that in future no guns above 9.45-in. shall be contracted for. The lengths selected are from 35 to 40 calibres, as Herr Krupp, who makes the heavy guns for the Austrians, declines to guarantee anything exceeding these lengths against drooping. Monster guns have been abandoned in the Italian navy, and the new ships are not to carry guns weighing more than 68 tons.

An English Electrical Mining Plant.—The most important instance of the application of water power for the electrical transmission of power in Great Britain is at the Greenside silver lead mines, in Cumberland. These mines are among the few that find it possible to compete with foreign mines, and this is chiefly because the use of electricity for winding, hauling and pumping has decreased the cost of working. The fall at the station is equivalent to a vertical head of 400 ft., and the effective horse power is about 200. The generating station contains one of Gilkes & Co.'s vortex turbines of 100 H. P.,

driving a compound dynamo. The current is conveyed by bare copper conductors on poles, the distance being 0.75 mile, to where it enters the mine at an elevation of 1,850 ft. above the sea-level. The conductors from this point are insulated and covered with lead. About 0.75 mile in the mine, or 1.5 mile from the dynamo, a 9-H. P. series motor is employed to wind ore from the set of sinkers; farther in the mine is fixed another 9-H. P. motor, working a three-throw pump, forcing the water 360 ft. in height. Half-way between these motors the pressure is reduced from 600 to 250 volts for working an electric locomotive in the lowest level of the mines, through which the water pumped from the 360-ft. level, and the whole of the water used by two hydraulic winding engines, is pumped. The total weight of the locomotive when loaded is 18 tons. The conductors in the level are phosphor-bronze wires. Great difficulty was experienced in fixing this plant. All main stations in the mine are lighted by incandescent lamps in series of six.

Clay Filters for Chemical Work.—A description of clay filters made by the Royal Porcelain Manufactory, Berlin, has been given in the "Journal of the Chemical Society." They are made of unglazed hard-baked clay, so hard that steel will not scratch them, endure a pressure of several atmospheres without breaking, and are attacked only—and then but to a slight extent—by hot concentrated sulphuric acid, or caustic soda. They are made in the shape of a flask with flattened bottom, of capacity 50 cc., 135 cc., and 1,000 cc. in the respective sizes, or as cylinders 19 cm. long of 50 cc. capacity. These filter at the rate of, roughly, 4,900 cc., or 8,600 cc., 29,600 cc., and 5,950 cc. of pure water per hour, respectively, with a difference of pressure of 700—720 mm. The rate is not much less when a turbid mixture is filtered instead of pure water. The filtration is very perfect. From water containing barium sulphate precipitated in the cold, or stannous sulphide, perfectly clear filtrates were obtained, and the complete washing of the precipitate was effected in from three-fifths to two-fifths of the time required with a folded filter. From milk and starch solution perfectly clear filtrates were also obtained, but these became somewhat turbid on standing. The filter is usually immersed in the liquid to be filtered, and connected several at once if required, with a large exhaustion vessel, into which the clear filtrate is run. This vessel is exhausted by means of a water pump and then left to itself. A great saving of the water used by the pump is thus effected, as compared with the ordinary method of filter pump filtration. The filters may be cleaned for further use by rubbing with sand, or, if this is not successful, by dipping in strong acids. If they have been used for filtering oil, for which they are also adapted, they may be cleaned by ignition in a muffle.

PATENTS PUBLISHED IN GREAT BRITAIN.

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

WEEK ENDING OCTOBER 21ST, 1893.

- 21,696 of 1892. Electric Smelting of Aluminous Ores. T. L. Willson, Leaksville, North Carolina.
- 21,701 of 1892. Electric Smelting of Aluminous and Other Refractory Ores. T. L. Willson, Leaksville, North Carolina.
- 1,138 of 1893. Utilizing Liquors Containing Sulphate of Alumina and Iron. L. Tralls, Dux, Bohemia, and E. Burmeister, Hamburg, Germany.
- 15,997 of 1893. Electric High Tension Fuse Head for Blasting. T. S. R. and W. A. Malson and E. Smith, Gloucester.

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:

TUESDAY, OCTOBER 24TH, 1893.

- 507,095. Furnace. Alexander Anderson, Sunderland, England.
- 507,118. Stone Breaker or Crusher. Albert J. Gates and Lewis J. Hewes, Chicago, Ill., Assignors to the Gates Iron Works, same place.
- 507,122. Dumping Wagon. George W. Harrington, Pullman, Ill.
- 507,126. Ore Elevator. Lewis J. Hewes, Chicago, Ill., Assignor to the Gates Iron Works, same place.
- 507,130. Electrolytic Production of Metals. Carl Hoepfner, Berlin, Germany.
- 507,140. Crushing or Grinding Machine. Cornelius Klöppl, Chicago, Ill.
- 507,143. Apparatus for Making Carbon Dioxide. Eduard Luhmann, Andernach, Germany.
- 507,156. Conveyor Belt. Robert Niedergesaess, Seattle, Wash.
- 507,166. Automatic Feeding Device for Rolling Mills. James Robertson, Cleveland, O.
- 507,204. Limekiln, Cupola, or Metallurgical Furnace. Edward J. Bird, Big Stone Gap, Va.
- 507,230. Process of and Apparatus for Deodorizing and Refining Crude Oils. Robert H. Laird, Toronto, Canada, Assignor to William H. Laird, New York, N. Y.
- 507,246. Manufacture of Blocks of Fuel. Gustav Spiecker, Bonn, Germany, Assignor of one-half to Gottfried Huettmann, Wiklitz, near Karbitz, Austria-Hungary.
- 507,252. Process of Manufacturing Gas. Hayden M. Young, Chicago, Ill.
- 507,274. Continuous Brick Kiln. Carl F. Kaul, Madison, Neb.
- 507,289. Pipe Welding Apparatus. James Simpson, McKeesport, Pa.
- 507,303. Crane. Henry Aiken, Pittsburg, Pa.
- 507,331. Process of Obtaining Hydrogen and Carbonic Acid Gas. Fritz Salomon, Essen, Germany, Assignor to the firm of Fried. Krupp, same place.
- 507,332. Metallic Roller. Frederick G. Sargent, and Allan C. Sargent, Graniteville, Mass.
- 507,350. Apparatus for Leaching Ores. William D. Bohm, London, England.
- 507,410. Druggist's and Chemist's Mortar. Fred. L. Brashear, Franklin, Pa., Assignor of two-thirds to Hugh H. Martin and Robert McCalmont, same place.
- 507,411. Kiln for Burning Limestone. John Briggs, Clitheroe, England.
- 507,432. Pulverizing Mill. Edwin C. Griffin, Newton, Mass.
- 507,441. Process of Refining Petroleum. Hermann Koehler, Long Island City, N. Y., Assignor to the Standard Oil Company, New York, N. Y.
- 507,445. Fan or Blowing Apparatus. Paul Mortier, St. Etienne, France.
- 507,460. Metallurgical Furnace. George F. Simonds, Fitchburg, Mass.
- 507,465. Amalgamating Machine. Stephen W. Vale, Forest Lodge, near Sydney, New South Wales.
- 507,477. Dry Press Brick Machine. George W. Blanks and Bernard Lefebure, Sydney, New South Wales.
- 507,491. Method of Manufacturing Gas. Mott P. Goff, Mattituck, N. Y., Assignor to the National Electric Gas Company of Kentucky.
- 507,500. Process of and Apparatus for Making and Burning Fuel Gas. Gomer Jones, Newark, N. J., Assignor of one half to the Brown Developing Company of New Jersey.
- Reissue 11,377. Ore Washer and Concentrator. Charles F. Pike, Philadelphia, Pa., Assignor to William A. Pike, trustee, same place.

PERSONALS.

Mr. James P. Witherow, of Pittsburg, sailed recently for Europe.

Captain Thomas Couch, manager of the Boston & Montana Company, has returned to Butte after two weeks at the World's Fair.

Mr. Thomas Nelson, treasurer of the Boston & Montana Consolidated Mining Company, is making his annual trip of inspection to the West.

Judge O. H. Picher, president of the Picher Lead Company, of Joplin, Mo., has gone with his family to Pasadena, Cal., where he will spend the winter.

Mr. Leonard Forbes Beckwith, well known in New York and elsewhere, is suffering from aberration of mind, which his friends hope will be only temporary.

Mr. John Price Wetherell, of Philadelphia, president and general manager of the Empire Zinc Company, has been in Joplin, Mo., looking after the interests of the company.

Mr. Joseph L. Giroux, superintendent of the United Verde copper mines, Arizona, has been visiting the World's Fair, and later spent a few days in Butte, Mont. He was formerly superintendent of Clark's Colusa mine, in Butte.

Dr. Elliott Coues, of the Smithsonian Institution, is in Tacoma, Wash. He is verifying the report made of the Northwest by the famous Lewis & Clarke expedition in 1804 and 1806, and is locating the exact route followed by them.

Mr. F. A. Winchell, for a number of years connected with the Crane Company, of Chicago, as auditor, has associated himself with the New York Belting and Packing Company, at 13 Park Row, New York, as manager of sales department. Mr. Winchell is a gentleman popularly known in the machinery trade, where he has acquired many friends.

Mr. John Fritz has resigned as consulting engineer of the Bethlehem Iron Company. At the meeting of the board of directors of the company last June, Mr. Fritz, who had been general superintendent of the company and its chief engineer since June 20th, 1860, resigned that position and was succeeded by Mr. Owen Leibert. The office of consulting engineer of the company was then created and Mr. Fritz elected to it.

OBITUARY.

Daniel L. Dawson, an iron manufacturer, but better known as a poet, died at his home in Philadelphia November 1st, aged 37 years.

Professor Grashof, a noted writer on civil engineering and the director of the Germau Association of Engineers, died in Karlsruhe, October 26th.

Samuel C. Cook, formerly of Joplin, Mo., where he owned some zinc properties, committed suicide in Brooklyn, N. Y., October 30th. He was 40 years old.

Thomas Dickinson, general superintendent of A. Pardee, the well-known coal operator of Hazleton, Pa., died at that place November 1st, aged 75 years.

SOCIETIES AND TECHNICAL SCHOOLS.

California State Miners' Association.—President Neff has appointed the following to act as an executive committee at large in arranging a Midwinter Fair exhibit: J. J. Crawford, Col. Frank McLaughlin, Prof. S. B. Christy, S. K. Thornton and W. C. Ralston. Mr. Neff has also appointed an advisory committee to confer with the executive committee, consisting of Hon. R. McMurray, J. Z. Davis and W. S. Chapman.

Missouri School of Mines.—Prof. H. K. Landis, who was recently appointed to the chair of mining and metallurgy at this school, has recently spent some time in the lead and zinc mining district with a view of familiarizing himself with the present method of operating the mines and the occurrence of the ore deposits. He also made an examination of a number of the large concentrating and dressing mills, as it is his intention to have a small concentrating plant erected at the school at Rolla. The State has appropriated \$25,000 for the improvement of the mining and metallurgy department, and a building will be put up for its special use.

American Society of Civil Engineers.—At the regular meeting in New York, October 18th, the paper for the evening was by Michael L. Lyuch, on "Railroad Location," and it was read by the secretary. Written discussions were presented from Messrs. Charles H. Snow, J. E. Greiner, James R. Maxwell, Harvey Linton, Bailey Willis, Charles W. Staniford, W. B. Story, Jr., Howard G. Kelley, D. H. Ainsworth, C. D. Purdon, R. G. Tarr, E. H. Becker, Henry Gannett and J. Q. Barlow. The paper was verbally discussed by Mr. P. F. Brendlinger and W. Shellshear. At the meeting held November 1st, the paper read was on the subject of "Protecting Piles Against the

Attacks of the Terebo Navalis on the Louisville & Nashville Company's Lines," by R. Montfort.

Michigan Mining School.—At its last meeting, the Board of Control voted to give the Geological Survey permission to erect a building for its permanent headquarters on the grounds of the school, at Houghton. Plans have been made for a building 22 x 36 ft., of sufficient size for present needs, but strict economy is required to keep within the limits of the present appropriations, and, in fact, part of the money will have to be raised by subscription; this has already been promised. The building will have a basement and two stories, and will contain the different collections of the survey, a main office and an office for drawing and microscopic work. Its construction will be begun early next season. It is believed that the location on the Mining School grounds will be of mutual benefit, as the pupils at the school will be able to use the collections of the survey and study the work in progress, while those connected with the survey will be able to use the library of the school.

Virginia Association of Engineers.—The fall meeting was held at Roanoke, Va., beginning October 27th. The Finance Committee reported that the funds of the association were in good condition. Mr. W. H. Adams, of Mineral City, was chosen vice-president in place of J. H. Fitts, deceased, and R. P. C. Sanderson, of Roanoke, a director in place of G. G. Gailard, resigned. A committee was appointed to choose subjects for discussion at the regular meetings of the coming winter. A memoir upon the late Mr. Fitts was read by Mr. E. J. Gillis, and ordered to be entered on the minutes. The Committee on Road Improvement reported progress and asked for an extension of time. This committee was instructed to report at the January meeting and to prepare a road law to be submitted to the Legislature. The report of the Committee on Building Laws for the City of Roanoke was read. On the following day, October 28th, the report of the Committee on Building Laws was generally discussed. In the evening the members of the association attended the annual dinner at the Hotel Lee. After the dinner a number of views of the World's Fair were shown.

Engineers' Club of Philadelphia.—At the business meeting of October 7th the Committee on Visitors presented a report upon the recent visit of 47 members of the French Society of Civil Engineers, who were duly entertained. The report was received and thanks voted the committee. Mr. John Birkinbine gave a description of the exhibit of the Krupp works of Essen, Germau, at the World's Fair, and Mr. W. H. Jaques described the exhibit of the Bethlehem Iron Company. A number of views illustrating these and other exhibits were shown the club.

At the regular business meeting of October 21st a number of new members were elected, and there was some discussion on measures to be adopted for extending the usefulness and influence of the club. Letters of thanks from the representatives of several foreign engineering societies were read. Mr. John C. Trautwine, Jr., described the exhibit of the Pennsylvania Railroad at Chicago, illustrating his paper with a number of views. Mr. John Birkinbine described, and also illustrated by views, the movable sidewalk on the pier at the Fair and also the pyramid in the Mines and Mining Building, which showed the relative volumes of the different minerals produced in the United States. Descriptions were given of some of the more important engines and dynamos in the Machinery and Electrical Buildings.

Engineering Association of the South.—At the regular meeting of the Association, in Nashville, October 12th, Prof. W. W. Carson, of Knoxville, presented a paper entitled, "A Plea for the More Rational Presentation of the Calculus." The beginner in the calculus finds the continuity of mathematical science broken, and instead of meeting the characteristic clearness of proof he is surrounded with perplexity and darkness. The author investigates the causes of this state of affairs and suggests the remedy. The calculus is defined as "that branch of mathematics which connects real with hypothetical quantities." The problem of the differential calculus is—given the real quantity, to find the hypothetical; that of the integral calculus—given the hypothetical, to find the real. The investigator desires to find a certain real magnitude, which, by reason of the complexity of the conditions, is beyond the reach of his mathematics; he turns to the hypothetical and considers a magnitude similar in nature to the real, and that would exist if the conditions were less complex; if this is within reach of his mathematics he passes, by the rules of integration, to the real; otherwise the process of the hypothetical is repeated until the conditions are sufficiently simple, then by a sufficient number of integrations the real is reached. With this conception of hypothetical quantities, we logically derive the equations gotten by the limit calculus, and what its "derivations" really are is shown; multiplying these equations through by dx gives the equations used in the infinitesimal calculus.

Engineers' Society of Western Pennsylvania.—At the regular meeting in Pittsburg, October 17th, Mr. G. Kaufman read a paper on "Natural Filtration for Domestic Water Supply." A paper from Mr. S. M. Wickersham, "To Extinguish Oil Fires,"

was read by Mr. Thos. P. Roberts. Both papers were fully discussed.

At the Chemical Section meeting, October 24th, an address was made by Dr. Chas. B. Dudley "On the Necessity for Standard Methods of Analysis of Iron and Steel," his main points being summarized as follows: When reputable chemists analyze identical samples with pure chemicals and disagree, the fault must be one of method. The adoption of standard methods would enable competent chemists to obtain strictly comparable results. Such methods would be revised when necessary, but should be regularly used until so revised. The work of the Committee on International Standards for the Analysis of Iron and Steel will produce valuable results. Their standards, however, will not be a check on difference of methods. A method of analysis may have reciprocating errors and give correct results on samples of one certain composition only. A chemist using such a method might agree with the standard sample and be wrong on all samples of different composition. A further shortcoming of standard samples as checks on methods of analysis is found in the consideration that unless the standard contains carbon, etc., in exactly the same state of combination in the steel in which it exists in all other samples analyzed by the same method, it is not a check on the correctness of the method.

INDUSTRIAL NOTES.

The Spang Steel and Iron Company, Pittsburg, Pa., has its blooming and bar mills running on single turn.

W. B. Pollock & Co., Youngstown, O., have resumed operations, giving employment to nearly all their old men.

The rolling mills at Tyrone Forges, near Altoona, Pa., resumed operations last week, after a long suspension.

The Detroit Foundry Equipment Company has received an order for two large cranes for a factory in Amsterdam, Holland.

The furnaces A and B, of the Carnegie Works, at Braddock, Pa., have gone into blast, and furnace C is being prepared to blow in also.

Wm. Tod & Co., Youngstown, O., are running with very nearly a full force of men; the orders on hand are principally small, but there are a number of them.

The Whately Malleable Iron Company, Muncie, Ind., have a contract from the Jeffrey Manufacturing Company, of Columbus, O., for 3,000 tons of endless chains.

Sarah Furnace, of the Kelly Nail and Iron Company, and Belfont Furnace, of the Belfont Iron Works Company, both at Ironton, O., have recently resumed operations.

It is reported from Pittsburg, Pa., that a new blooming mill will be erected in the Homestead, Pa., works, of the Carnegie Steel Company to replace the old one in the 28-in. mill.

It is stated that the Penn Iron Company, Limited, at Lancaster, Pa., has decided to close its rolling mill and other works on account of lack of orders. The company has employed 350 men.

The Berger Manufacturing Company, Canton, O., makers of sheet metal roofing and similar work, have just completed three new buildings, 65 x 602 ft., 40 x 320 ft. and 40 x 60 ft. They employ about 120 men.

Operations were resumed at the Portage Iron Works, Duncansville, Pa., October 30th. The workmen in the finishing mills accepted an average reduction of 25% in their wages. The works give employment to 500 men.

The Vulcan Steam Boiler Works have filed articles of incorporation to manufacture boilers and engines in Brooklyn, N. Y. The capital stock is \$10,000. The directors are L. Knapp, Frank M. Woodruff and Charles M. Balloch.

The blast furnace at the Jefferson Iron Works, Steubenville, O., was blown out recently, and has since been thoroughly repaired and a number of improvements put in. Two batteries of Babcock & Wilcox boilers have been added to the equipment.

Copake Furnace, in Columbia County, N. Y., owned by ex-Congressman Frederick Miles, went into blast October 21st, after having been idle for two months, during which time it was thoroughly repaired. The furnace runs on charcoal, and makes car-wheel pig iron a specialty.

The New York Knife Company, at Walden, N. Y., is building a new fireproof storehouse to be 28 x 100 ft. The side walls will be of brick and the roof of iron, designed and built by the Berlin Iron Bridge Company, of East Berlin, Conn., covered with their well known anti-condensation corrugated iron.

The partnership heretofore existing under the firm name of N. D. Doxey & Co., Elmira, N. Y., has been dissolved by the retirement of Mr. Benjamin Maurice. The firm will be continued under

the same name of N. D. Doney and C. J. Root, and will, as heretofore, operate the Elmira Rolling Mills.

The water commissioners of Detroit last week opened bids for 2,500 tons of cast iron pipe, ranging in size from 4 in. to 16 in. diameter. The bids varied from \$19.20 to \$21.20 per ton, delivered in Detroit, the lowest rate being offered by the Howard-Harrison Company, of Bessemer, Ala., and the next, \$19.45 per ton, by the Lake Shore Foundry Company, Cleveland, O.

James Simpson & Co., Ltd., of London, England, have issued a very completely illustrated catalogue, showing their steam engines, pumping engines and mine pumps of different classes. The pumps most prominently shown are of the Worthington type, and include not only the ordinary steam pumps, but compound and triple-expansion pumping engines for large works. Among the engines of this class furnished by this concern are included high-duty engines for St. Petersburg, Bombay and a number of English towns and cities. Mine pumps have also been furnished to a number of English collieries.

A Pittsburg, Pa., dispatch says that the Amalgamated Association Conference Committee has notified the Sheet Manufacturers' Association that the condition under which a 10% reduction of wages for sheet mills was demanded no longer exists. At a recent conference between the Amalgamated Association officials and iron manufacturers, the 2-cent card rate on bar iron was restored from the 1½-cent basis. The sheet manufacturers' demand was based on the 1½-cent rate. Now that the 2-cent rate is restored, the demand falls. It is understood, however, that the manufacturers will still demand the reduction.

Very little fault can be found with the mechanical execution of the catalogue just issued by the Field Engineering Company, of New York, describing the vertical engines for electric service, built by the Lake Erie Engineering Works, for which the Field company is agent. The engines are very fully described and illustrated, and a number of tables are given showing the result of tests of various engines now in service. The general idea of these engines is to furnish a compact, fast running engine which can be connected directly to a dynamo and can be built in units, so that power can be increased as desired by the addition of more units.

The Link-Belt Machinery Company, of Chicago, the first to introduce into this country rope power transmissions employing grooved iron sheaves, have had an unusual demand for this class of machinery. The Standard Oil Company was recently furnished a rope drive for distributing the entire power in the new barrel house at Whiting, Ind. A rope transmission was also designed and erected for the Lawson Varnish Company, of Chicago, which is to drive the machinery in their new plant on West Kinzie street. The Mississippi Cotton Oil Company, Columbus, Miss.; the Geo. L. Thompson Manufacturing Company, Chicago, and G. Brulay, Brownsville, Tex., are recent purchasers of rope transmissions.

MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" of what he needs he will be put in communication with the best manufacturers of the same.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufacturers in each line.

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

GENERAL MINING NEWS.

The Senate on October 27th passed a bill in which the mining States are greatly interested. It was the bill reported by Mr. Dubois to aid the States of California, Oregon, Washington, Montana, Minnesota, Idaho, Nevada, Wyoming, Colorado and South Dakota to support a school of mines. It provides that each of these States shall annually receive 25% of all moneys paid to the United States by each of these States for mineral lands within their territory for the maintenance of schools of mines; provided, that the sum so paid shall not exceed \$12,000 a year to each State, nor shall it exceed in any event the amount annually expended by each State for support of its school of mines. The bill was supported by Senators McPherson, Hoar and many others of the Eastern men. Subsequently, in the House, Mr. Wilson, of Washington, introduced the same bill.

ALABAMA

Cleburne County.

(From our Traveling Correspondent.)

Arbacochee.—The lessees of the hydraulic plant and mining property on Section 6, belonging to the Arbacochee Gold Mining Company, are busily engaged preparing to start up the works, which

have been idle for several months past. They expect to commence mining operations in a few weeks or as soon as they receive new machinery and pipe. At present work is being done on the houses for the accommodation of the employees, and constructing the slime boxes. It was from this property that a large proportion of the placer gold, credited to Alabama previous to the California excitement, was mined.

ALASKA.

(From our Special Correspondent.)

Alaska Development and Transportation Company.—Papers of incorporation have been filed at San Francisco with the following names given as directors: J. N. Harrison, F. C. Frederickson, O. Blankart, A. D. Grimwood and C. P. Grimwood. The capital stock is placed at \$5,000,000, with \$8,000 subscribed.

CALIFORNIA.

The California Debris Commission has heard the application of the Illinois mine, near La Porte, to resume hydraulic mining, and has taken the matter of granting a license under advisement. There was no opposition at the hearing. The Brandy City mine has been authorized to begin work on its dam, but Senator C. W. Cross has postponed operations until next year, owing to lack of time necessary to build the dam. The Excelsior Water and Mining Company, of Smartsville, has been granted a permit by the commissioners to mine by the hydraulic process, subject to the usual restrictions as to restraining debris. John Spaulding has made application to the commissioners for a license to operate the Polar Star hydraulic mine at Dutch Flat.

Amador County.

The Jackson "Amador Ledger" says:

Albany Gold Mine.—The tunnels now being driven through the Albany grounds are cutting stringers of quartz giving low assays.

Alma.—Work is progressing on this property as rapidly as the lumber for the various buildings arrive. The hoist and engine are on the road from San Francisco and will be put in position as soon as they arrive. The shaft is now down about 70 ft.

Argonaut Mining Company.—This company, whose property is located south of the Kennedy, has commenced sinking its three-compartment shaft.

Farrell Mining Company.—The 5-stamp mill recently purchased by this company at Middle Bar is rapidly being placed in position.

Mono County.

Noonday.—About 100 tons of ore from the old Noonday mine were recently crushed at the Bodie mill with satisfactory results. The mill is now running on ore from the Summit mine.

San Diego County.

(From our Special Correspondent.)

Ella Mining Company.—In the mine of this company, in the Julian district, a body of decomposed ore, rich in gold, has been found. Upon uncovering, a vein was found 3 ft. wide, from which the decomposed rock came. The assays run from \$25 upward.

San Francisco County.

(From our Special Correspondent.)

Altman Gold and Silver Mining Company.—This company is incorporated to operate in El Dorado County. The capital is fixed at \$2,000,000, with \$500 subscribed. The directors are: W. A. McNaughton, E. A. Aver, D. Hanlon, A. M. Brown and D. M. Angier.

New York Placer Mining Company.—This company has filed papers of incorporation to work mines in California. The capital stock is fixed at \$9,000, with \$250 subscribed. The directors are W. G. Roberts, W. E. Shephan, E. J. Duffy, C. A. Mahn and J. Roylance.

Yuma County.

(From our Special Correspondent.)

Pecacho Gold Mining Company.—Nearly 150 men are working at the placer ground, about 25 miles above the town of Yuma. Three Worthington pumps throw 300 miners' inches of water from the Colorado River, whence it is carried 86,000 ft. by an 11-in. steel pipe, a 500 HP. engine being used.

COLORADO.

Boulder County.

Late advices state that all the coal miners at Lafayette, Louisville and Erie have returned to work.

Bella.—The jury in the mining suit of the Bella mine vs. the Cash-Burkin, of Gold Hill, has decided that the ground in dispute, and from which it was claimed the Cash-Burkin folk took their rich ore, belonged to the Bella mine.

United Coal Company.—This company's miners, at Lafayette, are on strike, owing to their failure to receive their wages when due.

Coal—Fremont County.

Late advices from Florence are to the effect that trouble has again broken out between the coal miners and their employers in Fremont County. For the past fortnight 400 men have been idle at

Rockvale because their pay did not come on the 15th, according to promise from the company. As a result the mine is idle and no pay in sight yet. It now looks as if this mine, which has worked steadily all through the dull summer months, would be idle indefinitely. The miners have two grievances against the company, the one above mentioned and compulsory measures which are said to have been adopted to compel the men to trade at the company store.

At Williamsburg, at No. 2 mine, a new one only recently opened, where men are making from \$80 to \$95 per month, they are asking for an increase of wages. A meeting was held last week at which a series of demands was presented. The men gave notice to the company that their demands must be complied with by November 1st or they would go out on a strike. The company claims that it cannot grant this and run the mine at a profit.

El Paso County.

Cripple Creek Gold Mining and Investment Company.—This company, recently incorporated, has elected the following officers for the ensuing year: President, E. C. Billings, Denver; vice-president and general manager, N. E. Guyot, Cripple Creek; second vice-president, Joseph W. Watson; secretary, C. S. Sauerland, Denver; treasurer, S. Hamilton Guyot, Denver, who, with L. S. McLain, Colorado Springs, and S. M. Kirkland, Denver, constitute the board of directors. The company will transact business and operate in the several counties of Colorado, principally in El Paso and Gilpin counties, with headquarters in Denver.

Doubtful and Anna Lee Mining Companies vs. the Portland Mining Company.—Suit was begun October 25th at Colorado Springs, by the Doubtful and Anna Lee mining companies against the Portland Mining Company for an injunction to restrain the latter company from encroaching upon the territory belonging to the plaintiffs. The properties are at Cripple Creek. It is claimed in the complaint that the Portland people are tunneling and extracting ore from ground that belongs to the plaintiff companies. A temporary injunction was issued by Judge Campbell.

Gunnison County.

Irwin District.—At a meeting of the miners and mineowners in this district last week, it was mutually agreed to go to work in the mines under the Leadville scale of wages. The result of this agreement means that the Forest Queen and Mountain Gem mines will go to work just as soon as the water can be pumped out of the shafts.

Hinsdale County.

The following items of Lake City mining news are from our exchanges:

Black Crook.—The owners of this Hotchkiss Mountain property are running a cross-cut, which will cut the vein at a good depth.

Black Wonder.—This mine, at Sherman, is meeting with success. Something like 1,000 ft. of development work has been done on this property during the past two years. The owners are now working on drifts made from the bottom of a winze in the lower workings, and they are taking out some of the richest mineral ever taken from the mine. The winze is 60 ft. deep, while the drifts are run 45 ft. east and 15 ft. west. About 30 men are at work on this property and a car of ore is shipped each week. Mr. A. A. Allen, the superintendent, reports that the company expects to put up a mill this fall for treating the ore.

Broker.—There is a car of ore out ready for shipment, taken from this mine, near Capitol City. The ore is silver, lead and copper. It is a well-developed property, with large ore reserves in the several levels. Only three men are at work on the mine, yet they have no trouble taking out a car each month.

Lake County.

Bi-Metallic Smelter.—This smelter, at Leadville, blew in its furnace October 25th, and resumed operations after a shutdown of several weeks. Employment will be given to 150 men.

(From our Special Correspondent.)

Since the wage settlement, which provides for the payment of \$2.50 per day to miners until silver reaches 82½ as an average for the month, was adopted owners of the larger properties at Leadville have found it expedient to employ a small force of men, in order to protect their properties from irreparable damage. This programme has been followed in several instances, especially at the mines of the Smith-Moffat combination, where large bodies of high-grade ore are in sight, and can be shipped at a margin sufficient to allow of running expenses. The Maid-Henriette may be mentioned as an instance; also a considerable portion of the property under control of the Union Leasing and Mining Company, which includes some of the old-time producers on Fryer Hill, in some of which good bodies of lead ore are yet found.

The Bimetallic smelter recently resumed operations. It is understood that the Harrison Reduction Works have been sold to St. Louis parties and will open for business shortly. The Elgin recently made all necessary preparations for a resumption of work, but at the last moment deemed it advisable to wait a few weeks at the least. The fall of silver has provided an impetus to prospecting, and several new gold discoveries have recently been

made public, most of which lie in the Twin Lakes district.

As a result of the resumption at the Bimetallic smelter, the tonnage of ore in this district has increased during the past week from 700 to something over 800 tons per day. Most of the ore now produced consists of sulphides and iron, occasionally augmented by the shipment of small quantities of lead ore. A year ago the ore output of Leadville averaged over 2,000 tons per day.

Big Six.—T. Trebedo has purchased 75,000 shares of the stock of this mine, on Breece Hill, and will invest a large amount of capital in placing the property before the public as a producer.

Ouray County.

Genesee-Vanderbilt.—This mine, Red Mountain district, which closed down two weeks ago, reopened on the 26th ult., and is now working a good force.

Pitkin County.

Aspen Mining and Smelting Company.—Press dispatches state that the case of the heirs of Wm. J. Wood against this company and Jerome B. Wheeler, which has been carried through various courts, has been finally decided in favor of plaintiffs by the United States Supreme Court. The suit was brought to recover a share of the original one-third interest in the mine, which was owned by Wood and Wheeler. There are a number of heirs, each of whom will be entitled to a share.

San Miguel County.

For the week ending October 20th there were shipped from Telluride 1,001 tons of ore and concentrates, of which 946 tons came from the Smuggler-Union, 33 tons from the Hector and 22 tons from various other properties, says the "Journal."

The gold output of San Miguel County was never so large as now, says the Telluride "Journal." Mills steadily at work are the Gold King, 40 stamps; San Miguel Consolidated, 30 stamps; Suffolk, 20; Hector, 20; Sheridan, 35; Pinch Boys, 5; Taylor & Leonard, 10; besides the concentrating plants of the San Bernardo and Smith & Wade. Almost every day one or more gold reports are shipped to the Denver mint.

GEORGIA.

White County.

Calhoun.—The lease of this property to Mr. Geo. Slaton, says the Cleveland "Progress," has been canceled and the owners intend hereafter to work the mine themselves. The only reason for canceling is that the owners believe they can make more money than they could under lease.

IDAHO.

Alturas County.

Red Cloud.—In this mine a tunnel is being run 1,800 ft. to tap the ledge about 1,100 ft. below the surface, or 500 ft. below the present workings. The force in the mine and the concentrator embraces 40 men, and concentrates and clean ore are being shipped right along. Miners are paid \$3 per day; carmen, \$2.50 a day.

Solace.—This mine has been worked for the last year by Mr. C. J. Johnston, who has driven a tunnel 1,600 ft., tapping the vein at a depth of 900 ft. below the discovery. He has cut an ore body with the tunnel and is driving on the vein to a point below the upper working, when he will connect the two by a raise of about 450 ft. There is a 20-stamp mill on the property and it is stated that there is ore enough in sight to keep this mill going for some time.

War Dance.—This mine is working a small force preparatory to resuming operations on a larger scale.

Coeur d'Alenes.

Gem Mine.—About 40 men were set to work in this mine last week, and there are now some 700 employed in the mine and in the mill. Two shifts are at work and an additional force will be put on as soon as the price of lead warrants an increase of the same.

Tiger Mine.—Only a few men are now employed on this mine doing some development work. It is expected, however, that operations will be actively resumed about the middle of November.

Owyhee County.

Poorman Mines.—A rich strike is reported in this mine, the vein having opened out 9 ft. wide and carrying small pockets of extremely rich ore. It is stated that the capacity of the mill is to be increased to 50 stamps.

ILLINOIS.

Warren County.

Martin Coal Bank.—On October 25th three miners were severely, and possibly fatally, injured at this mine. The men were in a cage which had just been hoisted up the shaft and had reached the top when the rope broke letting them fall 140 ft. The accident is being investigated. It does not yet appear whether it resulted from defects in the rope or from carelessness in hoisting.

IOWA.

Scott County.

Pleasant Valley Coal Company.—The new shaft of this company has reached the coal vein and is now almost completed. The company expects to begin raising coal very shortly.

Webster County.

Holiday Creek.—The coal mines at this place have been leased by the owner, Mr. Measles, of Ohio, to J. L. Martin and O. J. Mericle, who expect to put on a large force of men to extend the workings and largely increase the output of the mines.

KENTUCKY.

Butler County.

Neal Coal Tract.—This tract, near Aberdeen, has been put under option to J. F. Phillips and others, who have begun work opening up a mine. The land adjoins the Aberdeen mine.

Whitley County.

Bennett Bird-Eye Coal Company.—This company has been organized with \$200,000 capital stock to work coal mines in this county. The principal stockholders are N. P. Hyndman and A. H. Whitsell, of Pittsburg, Pa.

MAINE.

Franklin County.

North Jay.—The quarries at this place have several contracts on hand and are working steadily. Some large work has been taken out recently, including some pillars which are intended to be over 23 ft. in height when completed and carved. These were shipped to the Murphy yards, at Lewiston, Me., for carving and completion.

MARYLAND.

Frederick County.

Baltimore papers report that in drilling a well on the Young farm, near Yellow Springs, recently, a vein of coal was struck. The coal is said to resemble Cumberland in quality.

MICHIGAN.

Copper.

Calumet & Hecla Mining Company.—Notice has been given to the employees of this company that a reduction of 10% in wages will be made to date from November 1st. This action is taken in consequence of the continued low price in copper.

Tamarack Mining Company.—On the afternoon of October 21st the hoisting rope in No. 1 shaft broke, letting the cage fall some 50 ft. to the bottom of the shaft. Fortunately there was no one in the cage at the time, and no one was hurt.

Iron—Marquette Range.

Blue Iron Mine.—Negotiations are in progress looking to the resumption of work.

Buffalo Mining Company.—The employees have been promised their back pay early in November. There is some talk about a resumption of work at the mine, but this is quite uncertain.

Dexter Consolidated Iron Company.—This company has started up its Dexter mine again and has commenced to take out ore. Nearly all the old workmen have been employed again. The mine has been idle for about two months, but the pumps have been kept going and the mine is clear of water.

Iron—Menominee Range.

Explorations are being made with a diamond drill on the Maas property near the Mansfield mine. So far the results have been promising and the work is to be continued.

Hollister Mine.—Negotiations are pending, says the "Diamond Drill," for the lease of this mine. The amount of royalty has been agreed upon, but there is still some difference as to the minimum royalty to be paid. The mine is not now being worked, but can be placed in condition to produce ore at a very moderate outlay.

Mansfield Mine.—A change of ownership is likely to be the result of the recent accident at this mine. It was at first reported that it would be abandoned, but it is now said that negotiations are in progress for the sale of the mine to the Chicago, Milwaukee & St. Paul Railroad Company, whose line runs within a short distance of the mine.

MINNESOTA.

Duluth County.

Iron ore shipments for the past week have been 21,893 tons from the Vermilion Range and 39,884 from the Mesaba. For the season: Vermilion Range, 762,395; Mesaba, 461,483. Mines on both ranges are closing, and the shipments for the remainder of the season will be restricted.

Mountain Iron, Biwabik and Oliver will continue shipping about 6,000 tons daily for two or three weeks.

Iron—Mesaba Range.

Biwabik Mine.—The contractors for stripping on this mine have put a considerable force at work and will continue as long as the weather permits.

Hale Mine.—Operations at this mine were discontinued last week, and the mine has been entirely shut down for the season, owing to a suit begun to recover past-due royalties.

Rathbun Mine.—Two steam shovels have been received at this mine and will be used for stripping purposes to prepare the mine for taking out ore in the spring.

(From our Special Correspondent.)

Iron King.—This mine, leased from the C. N. Nelson Lumber Company, at a 30-cent royalty, is

probably to be sub-leased to Franklin Rockefeller and Corrigan, Ives & Co. It will be stripped for steam shovel mining.

Mesaba Chief.—This mine is under option to a Chicago syndicate for sale at \$250,000. It is a State lease, 25 cents royalty.

Mountain Lion.—This property is being tracked in all directions for extensive stripping operations in the winter.

Iron—Vermilion Range.

Minnesota Iron Company.—It is announced that this company will resume underground work in December at its Chandler and Minnesota mines, and will employ a moderate force there through the winter preparing for regular work in the spring.

(From our Special Correspondent.)

Zenith.—There is probability that this mine, worked under a 25-cent lease from the Harvey Iron Company, will be sub-leased before next season. Its operation this year has not been satisfactory.

St. Louis County.

Imperial Mining Company.—This company, says the Vermilion "Iron Journal," is to be organized by the Chase-Hildreth syndicate to work the gold mines discovered in the Rainy Lake district, near the Canada border. The work carried on this season makes it fairly certain that a considerable body of low-grade ores exists in the district.

MISSOURI.

Jasper County.

(From our Special Correspondent.)

Joplin, Oct. 30.

We are again compelled to report an unsettled condition of the zinc ore market.

The majority of the mines are still in operation, but prices are unsatisfactory to the operators, and therefore the sales are light in proportion to the production. The average price paid for zinc ore during the week was \$16 per ton; some choice lots of high grade ore brought \$18.

The lead ore market was strong, and prices advanced from \$17.25 to \$18.50 per thousand.

Following are the sales of ore from the different camps:

Joplin mines, 1,019,640 lbs. zinc ore and 287,250 lead; value, \$13,328.

Webb City mines, 198,440 lbs. zinc ore and 55,680 lead; value, \$5,763.

Carterville mines, 1,041,640 lbs. zinc ore and 154,340 lead; value, \$11,034.

Zincite mines, 162,590 lbs. zinc ore and 4,810 lead; value, \$1,385.

Oronogo mines, 63,000 lbs. of lead ore; value, \$1,043.

Galena, Kan., mines, 800,000 lbs. of zinc ore and 215,740 lead; value, \$10,167.

District's total value, \$42,720.

Granby mines, 201,150 lbs. of zinc ore and 37,220 lead; value, \$2,242.

Mosley mines, 11,330 lbs. of lead ore; value, \$193.

Aurora, Lawrence County, mines, 1,010,210 lbs. of zinc ore and 230,140 lead; value, \$6,968.

Peoria, Ind. T., mines, 16,640 lbs. of lead; value, \$283.

Lead and zinc belt's total value for the week, \$52,406.

Macon County.

Notices have been posted at the Loomis and the Kansas & Texas coal mines at Bevier offering the strikers 50 cents a ton, the old wages, with the alternative of permanent loss of work. The men have replied by an offer to arbitrate.

MONTANA.

Meagher County.

Benton Mine.—This mine is working about 30 men at present, more than half of them being engaged on development.

Broadwater Mining Company.—This company now has 60 men on its payroll, and is taking out between 40 and 50 tons of ore daily. The Neihart "Miner" reports that the lower tunnel is now in 350 ft. and that the grade of the ore is improving as the tunnel advances.

Eighty-eight Mine.—This mine made its first shipment of ore from Neihart last week. It is owned in Boston and is under the management of T. C. Simpson.

Galt Mine.—This mine has been started up with a crew of 10 men and has begun shipping ore.

Missoula County.

San Martina Mining Company.—This company has been reorganized and will at once begin work on the development of its claims. A 10-stamp mill will be put up in time to begin work in the spring. The company owns several claims with gold prospects, adjoining those of the Nine-Mile Mining Company.

Park County.

Cokedale Coal Mine.—A bad fire started October 23d on the fourth level of this mine, near Livingston. This level is 1,000 ft. underground, and 50 miners were employed there. The fire spread rapidly, but the alarm was sent to all parts of the mine, and all the men escaped but one, who is missing and is supposed to have perished. Fire apparatus was sent from Livingston and Helena by special train. At latest accounts the fire was still burn-

ing, but was confined to the fourth level, where it started, and the mine is being flooded as rapidly as possible. The loss will be considerable.

Silver Bow County.

Amador Mine.—This mine is now being worked by W. J. McNamara and others, who are taking out ore enough to pay expenses. The ore is now running about 45 oz. of silver to the ton.

Big Pipestone.—In this canyon, says the Butte "Miner," John A. Leggat has been making extensive preparations for hydraulic work. After a careful examination he satisfied himself that the work would pay, and his preparations have been made accordingly. Four miles from the head of the claim a tunnel, 1,500 ft. in length, has been run to carry water from a stream which will give 15 in. at the lowest stage, and 250 in. at high water. From the tunnel this water is carried through a ditch to the head of the claim at a height of 150 ft. above bedrock. The flume is made of Oregon pine and fir, and is substantially built. About 2,500 ft. are completed and 200 ft. more in progress, which will finish the flume, while nearly 2,500 ft. of side ditches are under construction to carry the water around the workings wherever it may be needed. A reservoir of sufficient size to hold the water and divert it to the side flumes as required has also been built. The work has cost over \$38,000. In addition to the placer ground Mr. Leggat has located a quartz claim in the vicinity, which is said to yield well in free gold.

Blue Bird.—At this mill, according to the Butte "Inter-Mountain," the Russell process is working satisfactorily on the old tailings. It is estimated that there are enough tailings on hand to keep the mill busy for a year or more.

Hillside Mine.—A bond on the Hillside and William lodes has been taken by Griggs & Cobban for one year, for \$50,000. This claim adjoins the Rockbreaker mine, in Horse Canyon, which is owned by the same parties. They are now sinking the shaft 150 ft.

Jenny Dell.—The sub-lessees on this mine have been ousted by a decision of the court, at Butte, and the mine restored to the original lessees, Wenner & Holland, who will work it themselves.

Lexington Mining Company.—This week 30 out of the 60 stamps in this company's mill were started up. There is enough ore on hand to keep the stamps in operation for several months, but mining, it is stated, will also be continued. Most of the ore comes from the Lexington mine, which is now being worked under lease by a number of the company's old hands. The remaining half of the stamp mill is to be thoroughly overhauled and repaired.

Paulin Mine.—This mine is now being worked by Bricker & Swenck as lessees. The shaft is being sunk 100 ft. further, making it 450 ft. in all, and a cross-cut will be driven to the south vein from the 350-ft. station. The face of the cut is now in about 100 ft. and is advancing at the rate of 5 ft. per day. The vein is supposed to be the same as that of the Mountain Consolidated and Buffalo mines.

(From our Special Correspondent.)

Butte, Anaconda & Pacific Railroad.—The track-laying on the hill at Butte is nearly completed to the Syndicate and Anaconda mines. The line substantially follows the course of the old Montana Union tracks, lying generally a little higher up the hill. Besides the main line, which leaves the Great Northern north of Colusa and winds round above the Silver Bow and Lloyd tunnel, there is a connection from the Mountain View Spur of the Great Northern, which connects with the upper or supply tracks, at the High Ore. This is to provide an easy switching for timber, etc., without bringing it round by way of Butte. The High Ore lower switch is also connected with the Mountain View Spur.

Butte City.—Though everything is dull here and the tendency is to depression on account of the silver outlook, the situation has been somewhat relieved by the large amount of grading and sewer construction undertaken by the city and the excavations for the new railroad. These, however, must be soon completed. The silver leads are given up to leasers with the sole exceptions of the Black Rock, on the east end of the Rainbow and the Travona to the southwest of the city. Almost all of the copper properties are working, but with small or diminished forces.

NEVADA.

Storey County—Comstock Lode.

The stockholders of the Alta and Lady Washington mining companies have authorized their directors to sell the shares which have accumulated in their treasuries.

From the latest weekly official letters of the superintendents of Comstock mining companies we learn that the recently started prospecting work on the 1,465-level of the Ophir and Mexican mines continues, but no important changes in formation have yet occurred. On the 900-ft. level of the Union shaft the joint Sierra Nevada and Union north drift from the west drift, 1,520 ft. west of the shaft, has advanced 10 ft.; total length, 224 ft.; face in clay and quartz giving low assays. A strong flow of water was struck, and since that they have been engaged in cutting a drain and repairing the drift. In the Best & Belcher and Gould & Curry

mines the usual prospecting work is being done, without any changes of importance. In the Chollar mine the north drift, 145 ft. north of south line, 100-ft. level, is out 138 ft.; face is in quartz and porphyry. Eighteen feet back from the face of this drift they have started a crosscut west, which is now out 20 ft.; face in porphyry. They are yet engaged in making repairs to the main incline below the 930 level. At the Ward shaft the west drift from the station, 820 level, is out 250 ft. from the shaft; face in porphyry. In the Occidental Consolidated mine they have extracted from the stopes above the 400 level about 10 tons of ore of the average value, as per car samples, of \$38 per ton. The west crosscut from No. 2 upraise, started at a point 75 ft. below the 300 level, is in 71 ft.; face in porphyry, with seams of quartz.

Consolidated California & Virginia Mining Company.—The late weekly official letter says that the only place in the mine from which ore was extracted during the week was in the south drift from the winze, 52 ft. below the 1,650-ft. level. From this point 18 tons of ore, assaying \$28.08 per ton, were taken out. Most of the work in other parts of the mine is on repairs. The galloways frame (including foundation) at the Consolidated Virginia shaft has been thoroughly repaired. The expense of this work has been paid in full—amounting to a little over \$900. Everything is now in readiness to proceed with the work of making necessary repairs to the shaft between the surface and the 1,000 level.

Consolidated California & Virginia Mining Company.—This company, says the Virginia City "Chronicle," is preparing to once more work this mine through the old Consolidated Virginia shaft. Eight or ten men are employed in and about the old works, making repairs to them. A new galloways frame is being put in. This shaft has been shut down for a long time. The work going on now marks the inception of two new departures in mining. When the shafts and drift have been cleaned out not only will work be resumed in the upper levels of the Consolidated Virginia, but the West Consolidated Virginia will also work its ground through this shaft.

Hale & Norcross Mining Company.—The latest official letter says: On the 1,300-ft. level we have sunk the winze 5 ft. during the week, continuing in ore. Total depth of winze, 33 ft. Have extracted 10 cars of ore, assaying, per car sample, \$26.40, and 10 cars of ore assaying \$15.78 per car sample.

Potosi Mining Company.—The latest weekly official letter says: The north drift is 63 ft. below the 1,000 level, which is out 70 ft.; the face shows 3 ft. of fair grade ore. Extracted and sent to the mill the past week, 187 tons 500 lbs. of ore from the 1,150 level. Milled during the week, 187 tons. On hand at mill, 100 tons and 1,200 lbs. Average battery assays, \$17.33; average car sample assays, \$18.68.

Savage Mining Company.—The latest weekly official letter says: On the 1,100 level we are extracting the usual quantity of fair grade ore from the 12th to the 20th floor. During the week we have hoisted 279 cars of ore; shipped to the Nevada mill 210 tons and milled 210 tons; car samples average \$27.47; battery samples average \$23. Bullion yield for the week, \$3,381. In the south compartment of the main hoisting shaft we are putting in new guides from the 1,300 to the 750 level. In the east crosscut from the south drift, 950 level, we have commenced stoping ore.

(From our Special Correspondent.)

The following is the weekly tabulated statement of ore hoisted from Comstock mines, with the car sample and battery assays, bullion product, etc.:

Mines.	Ore Hoist'd	Car Sample Assay.	Ore Milled.	Av. Battery Assay.	Bullion for Week.	Total.
Con. Cal. & Va.	18	\$28.08	.....	.....	.....	.....
Hale & Norcross	10 ¹	26.40	.....	.....	.....	.....
Occidental	10	15.78	.....	.....	.....	.....
Potosi.....	187	38.00	.....	.....	.....	.....
Savage....	279 ²	18.68	187	\$17.33	.....	.....
		27.47	210	28.00	\$3,381.00	.....

¹ Cars. ² Crude bullion.

Consolidated California & Virginia Mining Company.—Mr. J. Rule, who has the contract to uncover an ore body in this mine, will leave for the Comstock next week. Meantime, C. T. Harper, foreman of the mine, has received his instructions regarding the preparatory work. A drift will probably be started on the 1,000 level, running southward toward the point where Rule says an ore body is situated.

NEW HAMPSHIRE.

Carroll County.

Maine & New Hampshire Granite Company.—This company's quarries, at North Conway, are steadily working, having some large contracts to be filled.

NEW MEXICO.

Grant County.

The assessed value of the mines and mills of Grant County is \$152,050, and of the surface improvements on mines \$78,740.

Gaddis.—This mill, at Gold Hill, has started up again. The owners hope to be able to keep the mill running on the product of their own mines and custom ores. Since the starting of the mill a number of hitherto idle properties will be worked on a small scale.

Texas.—Work on this mine, at Central, has been resumed with a small force of miners.

The following items are from the Silver City "Enterprise":

Bremen.—J. J. Brady and Martin Maher are working a lease on a portion of the Bremen or 76 mine.

Deep Down.—A bar of bullion weighing 64 lbs. has been shipped from the Deep Down mill, at Mogollon. This is the second shipment made since the mill started operations; the first shipment weighed 92 lbs.

Fraction.—The owners of this mine, on Chloride Flat, have struck a body of ore which will run from 400 to 600 oz. per ton in silver.

Golden Star.—This property, which is a recent discovery of Bragaw and Potter's, is said to be turning out well. Twenty tons of ore are now on the dumps. Four men are employed.

Little Fannie.—This mine, in the Mogollons, has shipped two bricks weighing 211 lbs. and valued at \$4,400.

Pacific.—Mr. N. Bell has shipped from Pinos Altos 265 oz. of gold, the product of a short run on Pacific ore. This makes 320 oz. for a week; the mill is of 10 stamps capacity.

Texas.—This mine, at Central, has again resumed operations and is employing six miners.

NORTH CAROLINA.

Iredell County.

Charlotte Granite Company.—This company has been incorporated to work granite quarries near Mooresville.

Mecklenburg County.

Surface Hill Gold Mine.—Several items sent by correspondents have recently been published in the "Journal" in relation to this mine, indicating that some rich ore had been found. We are now informed on good authority that a very thorough examination of this mine was made about two years ago by an entirely competent mining engineer, and that explorations, not only on the surface, but by sinking three shafts from 20 to 40 ft., failed to show anything of value. At that time surface washings over 4 or 5 acres showed about 8 cents per cubic foot, while the shafts showed two veins from 1 in. to 5 ft. wide, but all of barren slate nucleus with a thin quartz envelope containing little gold. Nothing was found to indicate the possibility of valuable developments. This report in relation to the mine would seem to be of more value than the rumors now current.

OHIO.

Allen County.

Lima Natural Gas Company.—This company is drilling 14 new wells in the St. Mary's field, some of which are reported to be good producers. The company has completed a new pumping station containing a full plant of pumps and boilers, and giving double the capacity of last winter.

Jefferson County.

Kelly Farm.—While sinking a shaft for coal in this place, in Warren Township, near Steubenville, gas was struck at a depth of 318 ft. The gas is burning and the pressure is said to be 100 lbs. The discovery is on a line between the Barnesville and Turkey Foot gas fields, but no gas has heretofore been found in the immediate vicinity.

OREGON.

Union County.

Allie Woodman Mine.—At this mine, near Sparta, the shaft is now 105 ft. deep, and at the bottom a vein 3 ft. wide carrying free gold has been exposed. The property has been bonded to Utah people and it is probable that a sale will follow.

PENNSYLVANIA.

Anthracite Coal.

A Pottsville dispatch says that the miners of the Schuylkill region will be paid at the rate of 3% above the \$2.50 basis for the last half of October and the first half of November. This is a decrease in wages of 2% on last month.

Lehigh & Wilkes-Barre Coal Company.—An explosion of gas occurred October 30th at this company's Stanton shaft, at Wilkes-Barre, by which two men were killed and four others severely injured. The officials believe the accident to have been caused by a change of the air current, allowing the gas to accumulate.

Lehigh & Wilkes-Barre Coal Company.—This company, says the Wilkes-Barre "Leader," has renewed work on its extensive improvements, giving employment to 500 or 600 men. Work has been resumed on the new Ashley shaft, which is already down 340 ft., and which will be sunk 330 ft. farther before the Baltimore vein is encountered. It is from this vein that the company will begin to mine coal. It is not expected that the work will be completed before the summer of 1894. Work has also been resumed at the new shaft at South Wilkes-Barre. This shaft is in four compartments

and is now down only about 70 ft. It is to go 600 ft. below the surface to reach the Hillman vein, and this work, like that at Ashley, will not be completed before next summer. The force has resumed operations at the new airshaft at Lance colliery No. 11, at Plymouth. This work will take some time to complete. The Ashley breaker, which was nearly completed when work was stopped, is now receiving the finishing touches. The machinery is all in, but there is a good deal yet to do. The breaker will not be used until the adjacent shaft is ready for hoisting.

Indiana County.

Undercliff Natural Gas Company.—This company, says the Pittsburg "Chronicle-Telegraph," will apply for a charter shortly. The owners of the property who will organize the company are Xavier Wittmer, D. C. Cowley, John R. Rush, M. L. Zahniser and Samuel Kelly. They control about 1,000 acres of territory and have about four producing wells in Shaler and Indiana Township. About seven miles of pipe line have been laid and the line is to be extended to Pittsburg.

Oil—Susquehanna County.

Petroleum has been discovered on the farms of Roderick Bailey, Isaac Van Auken, Albert Kent and John Lee, in Brooklyn, Susquehanna County. The Standard Oil Company is leasing all the land possible and will proceed to put down wells at once.

SOUTH CAROLINA.

The river phosphate owners who asked for a reduction of the royalty paid the State, on account of their heavy losses from the recent storms, have received a decided refusal, Governor Tillman having informed them that no reduction will be made by the commission, nor will any recommendation to that effect be presented to the legislature.

SOUTH DAKOTA.

Custer County.

Gold Star Mill.—According to the Deadwood "Pioneer" the experimental run of the Gold Star mill, near Custer City, has proved that the ores found there can be successfully treated by plate amalgamation and concentration. In this initial run some 40 tons were put through the mill, 10 out of its 20 stamps only being used; between \$4 and \$5 per ton was recovered on the plates and the balance in the form of concentrates. It was found, however, that owing to the weight of the pulp, the two concentrators could not handle properly the pulp from the 10 stamps; the mill was then shut down. Mr. W. W. Olds, the superintendent, has ordered two more tables of the Perfection pattern. They will be shipped in a few days, and when in place the mill will be started up for a continuous run.

Lawrence County.

Deadwood & Delaware.—This smelter was blown in October 25th, and stacks Nos. 1 and 4 are in full blast. The drift run under the Red Creek by the smelter company to tap the bedrock flow of water has been completed, and an amply supply of water secured.

Keystone Mining Company.—This company's mine, says the Deadwood "Pioneer," has resumed operations under the management of John Munger, receiver. The creditors of the concern have, it is understood, made an agreement with the company, whereby they, the creditors, are to be paid pro rata from the proceeds of the mill until the company's obligations shall have been canceled.

(From our Special Correspondent.)

Bald Mountain Consolidated Mining Company.—The deal between this company and an English syndicate, for the company's interests at Bald Mountain and Garden City, has been closed, and a new company organized, all the stock being held in London. The price paid for the property is \$500,000. The new company is known as the "Thunderer Gold Mining Company, Limited." The paid-in capital is \$1,500,000; working capital, \$250,000. The company will use the chlorination process and will erect a plant of 250 tons daily capacity on their property at Bald Mountain. The names of the local officers, who were brought from London, are: C. G. Warnford Lock, mining engineer and general manager; F. N. Bousfield, chemist; A. Worthington Tapps, director and vice-president; T. Hall, secretary; John Hall, solicitor. The property involved in the deed is 60 acres at Bald Mountain and 80 acres at Garden City, and a 50-ton chlorination plant at the same city. The property lies on the Blanket, or flat ore formation. The ore is of the brown oxidized character, averaging \$25 per ton, with a slight percentage of silver. All the properties have workings upon them.

Gold Extraction Company.—The cyanide plant of this company is nearing completion. Two sets of ore tanks are already placed and the two other sets ready for placing. The solution and sump tanks, the Morrell pulverizer and crushing rolls, are in place, as is the balance of the machinery, with the exception of the engine, not yet arrived. The company's mines are working a force of 11 men taking out ore. They have 1,500 tons stacked on the dump already. This plant will be run on custom ore in connection with the company ore. The charge per ton for treatment will be \$5. The plant will be placed in operation about November 15th.

TENNESSEE.

McMinn County.

Local papers report that gold-bearing quartz has been found in the mountains 30 miles east of Athens. A company has been formed to make further explorations.

UTAH.

Salt Lake County.

The receipts of ore and bullion in Salt Lake City for the week ending October 25th were to the aggregate value of \$145,923, of which \$105,923 was in bullion, and \$40,000 in ore. For the previous week the receipts amounted to \$177,072, of which \$124,151 was in bullion and \$52,921 was in ore. Receipts of Mingo bullion during the week amounted to \$27,184; Hanauer bullion, \$20,650; base bullion, \$32,200; Ontario bullion, \$17,464; copper bullion, \$3,925; silver bars, \$2,400; gold bars, \$2,100. Ore receipts during the week were \$13,500 by McCormick & Co., and \$26,500 by T. R. Jones & Co.

The shipments of ore and bullion from Salt Lake City for the week ending October 21st, inclusive, were: 1,116,993 lbs. of bullion and 951,727 lbs. of silver and lead ores.

It was reported among mining men, at Salt Lake City last week, that the ore buyers had refused to bid on any more silver ores. A "Tribune" representative asked A. Hanauer, of the Hanauer smelter, and T. R. Jones, of the Germania, if this was true, and both of them denied it, saying that they are bidding on all the ores that are offered.

Niagara Mining and Smelting Company.—At the annual meeting in Salt Lake recently the following directors were chosen: Gilbert E. Palen, Samuel Huckel, Jr., A. J. Kynett, C. H. Schermerhorn and George B. Langley. The following officers were elected: President, Gilbert E. Palen; vice-president, Samuel Huckel, Jr.; secretary, C. Howard Schermerhorn; treasurer, George B. Langley. This company was awarded a medal for its exhibit of ores at the World's Fair, which occupied a conspicuous position in the Utah section in the Mining Building.

Summit County.

Bald Eagle.—According to the Park City "Record," this group is to be developed on an extensive scale shortly. The right of way through the Deer Valley Consolidated group has been obtained, and arrangements completed whereby the 500-ft. tunnel in that ground will be extended to the Bald Eagle group. Machinery will be placed at once. A survey has been made and it is calculated the Deer Valley Consolidated tunnel will have to be extended some 700 ft. before the vein is encountered. It is estimated that the vein will be cut at a vertical depth of between 1,100 and 1,200 ft.

Creole.—A strike is reported at this property, in Park City. The pay streak is said to be 2 ft. wide and is of good chloride and carbonate ore.

Ontario Mining Company.—On October 15th, this company shipped 46 bars of bullion, containing 23,860 oz. of fine silver. Also 259,660 lbs. of ore.

VIRGINIA.

Spottsylvania County.

Taylor Quarries.—Mr. J. S. York, who recently leased these quarries on the Rappahannock, near Fredericksburg, has put on a considerable force of men and is getting granite out rapidly. The stone is said to be of excellent quality.

WEST VIRGINIA.

Coal.

Davis Coal & Coke Company.—Mr. Henry G. Buxton has been chosen vice-president of this company in place of Col. Thomas R. Davis, resigned. Mr. Robert F. Bopst succeeds Mr. Buxton as manager of the Piedmont office.

Kanawha District.—The coal mines along the Kanawha have been unusually fortunate this season. They have just had the fifth "coal-boat rise" and have been able to send out all the coal mined and ready for the river markets, which have been left bare by the inability of the Pittsburg coal men to strip.

Oil.

Standard Oil Company.—This company has begun work on a new pipe line from Morgantown to Philadelphia. It will be a 6-in. pipe, with a daily carrying capacity of 15,000 barrels.

WISCONSIN.

Iron—Gogebic Range.

Metropolitan Land and Iron Company.—This company will do a moderate amount of work in preparation for next season. There are now seven mines on this range shipping ore. Negotiations are in progress with the railroads for a reduction of freight rates.

WYOMING.

Albany County.

Keystone.—The stamp mill at this mine, says the Laramie "Boomerang," has been leased to N. M. Grant, who intends to run the mine on the ore now on hand from the Keystone mine, and will afterward run it as a custom mill for other miners in the district. A number of them have taken out and are taking out small lots of ore which they desire to work.

Laramie County.

Adams Mill.—This mill, at Silver Crown, about 20 miles from Cheyenne, has been leased to J. A. Smillie, of Omaha, who owns several claims in the vicinity which he intends to work.

FOREIGN MINING NEWS.

BRAZIL.

Ouro Preto Gold Mines.—The return for the month of September says that 3,139 tons of ore were crushed, yielding 1,055 oz. of gold. The superintendent states that although the yield is 24 oz. more than for August the value is about the same as the standard is somewhat raw.

BRITISH COLUMBIA.

(From our Special Correspondent.)

In the Slocan district everything is lively, and shipments are being made from several claims, while others are preparing and taking out ore in readiness to ship when the Nakusp-Slocan Railroad shall be completed to Three Forks, which will make it possible to ship ore at a reasonable rate. A wagon road is nearly completed from Three Forks to New Denver, which will be very useful to the district.

Kootenay Hydraulic Company.—This company is washing with a No. 3 monitor at Fifteen-Mile Bar, near Waneta. The results so far have been good, and the company is making arrangements to put in two more monitors in the spring.

Reed & Robinson.—This group of mines on Four Mile Creek has been bonded again to Finch & Clark, of Cœur d'Alene, for \$40,000. The mine was bonded by some English parties last winter, but when the drop in silver came their representative threw up the hand, after doing some \$5,000 worth of work.

Silver King.—This is the only property at Nelson on which much work is being done, and plans have been made to do considerable developing during the winter. A shaft will be put down on the Kootenay Bonanza, and drifts will be run both ways from the winze in the main tunnel. A drift will also be run from the Old Silver King shaft. Contracts have been let for this work, which will employ about 40 men for the winter. Surveys are completed for the tramway to carry out the ore, but it will not be built until spring. About 100 tons of picked ore are to be shipped to Swansea as a trial load for treatment.

CHILE.

La Compania Minera Panizo.—Capital \$400,000 Good work has been done in this mine, entirely with a view to development. It is at present sending down to Iquique from 7 to 7½ tons per day of an average assay of 75 oz. per ton, and there is a considerable amount of ore in sight. Water has been encountered at 85 meters vertical, and electric pumps and lights are being fitted.

Mina Grande.—This mine, belonging to Messrs. Romero & McIver, is worked through the tunnel of the Florida Mine and is sending down very rich metal, but, as it is a private concern, it is difficult to get correct figures. Still, it is known that more than \$100,000 per month of ore was sold to the mills for some time past.

GERMANY.

The silver mines of Saxony are suffering from the depreciation in the value of silver, like those of the rest of the world. A correspondent of the "Vossische Zeitung" reports that the Jungehohe Birke, Zenith and Vereinigte Feld near Weigmannsdorf have recently closed down. All the fiscal mines of the Freiberg District are severely affected.

GREAT BRITAIN.

A cable dispatch says that the Durham coal mine owners have asked the Miners' Association to appoint delegates to form a permanent joint conciliatory board. The miners favor the project and have suggested that a conference be held on the subject.

MEXICO.

Durango.

Lustre Mining Company.—This company of Pittsburg, Pa., working mines at El Oro de Magistral, has very large bodies of gold ores running from 2 to 4 oz. gold per ton. The company recently erected reduction works and is already operating on an extensive scale.

San Andres, Promontorio, Candelaria and Mina de Vaca are all being worked on a large scale and with good results.

NOVA SCOTIA.

Canada Coal and Railway Company.—The new opening at the Joggins mine is so far completed that the company will begin hoisting coal from it next week. The coal from this slope is expected to add one-third to the daily output of the mine. The excessive rainfall of the last month has given full employment to the pumps at the main slope, and a new pump has just been put in to throw water from the 2,300 ft. level. Provision has also been made for additional steam power, so that no amount of rainfall in the future will sufficiently employ the steam to prevent the hoisting of the full output of coal. This mine has given steady employment to its full complement of men all through the season, with the exception of a slight delay from insufficient steam power during the recent floods of rain.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Nov. 3.
Statement of shipments of anthracite coal (approximated) for week ending October 28th, 1893, compared with the corresponding period last year:

	1893. Tons.	1892. Tons.	Difference.
Wyoming region	543,815	527,831	Inc. 15,984
Lehigh region.....	173,216	154,314	Inc. 18,902
Schuykill region.....	322,479	245,612	Inc. 76,867
Totals.....	1,039,510	927,757	Inc. 111,753
Total for year to date..	35,304,040	34,321,907	Inc. 982,133

PRODUCTION OF BITUMINOUS COAL, in tons of 2,240 lbs., for week ending October 28th and year from January 1st:

	1893.		1892.
	Week.	Year.	Year.
Shipped East and North:			
Phila. & Erie R. R.....	2,752	68,062	73,720
Cumberland, Md.....	85,435	3,431,294	3,150,070
Barclay, Pa.....	413	40,288	57,722
Broad Top, Pa.....	7,846	488,462	516,523
Clearfield, Pa.....	64,629	3,164,413	3,278,144
Allegheny, Pa.....	22,446	1,032,632	1,055,766
Beech Creek, Pa.....	42,721	2,335,404	1,909,514
Pocahontas Flat Top.....	59,299	2,304,367	2,165,483
Kanawha, W. Va.....	71,689	2,673,526	2,052,348
Totals.....	357,230	15,538,408	14,259,290

* Week ending Oct. 21.

	1893.		1892.
	Week.	Year.	Year.
Shipped West:			
Pittsburg, Pa.....	26,390	997,163	1,047,594
Westmoreland, Pa.....	28,505	1,554,705	1,429,513
Monongahela, Pa.....	16,445	580,253	546,204
Totals.....	71,340	3,132,124	3,023,311
Grand totals.....	428,570	18,670,532	17,282,601

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending October 28th, 1893, and year from January 1st, in tons of 2,000 lbs.: Week, 38,941 tons; year 3,420,383 tons; to corresponding date in 1892, 4,454,865 tons.

Anthracite.

In the Eastern anthracite markets the month opens quietly. There has not been much activity during the past week and the trade generally is reported as very quiet and devoid of features of special interest.

The mild weather which has prevailed of late is not calculated to please producers, who must soon be forced to depend on the Eastern market for an outlet. In the meantime there has been little new buying and the advent of cold weather is looked for with more or less eagerness.

As foretold in this column some weeks ago the output for October was the heaviest of the year. The shipments of anthracite coal (approximated) for the four weeks ending October 28th aggregated 4,082,059 tons. At the meeting of the sales agents held in this city last week it was recommended that the output for November be 20% less than for October. Prices were left unchanged.

Inasmuch as there never was an instance in which the output for any month was less than the amount recommended by the sales agents November's production will probably not be less than 3,500,000 tons. While less coal is being stocked, by the companies there are many who would have us believe it is specially desirable just now to avoid over-production. Prices, so far, have been, and are being, fairly well maintained, all things considered, and, compared with other industries, the coal trade is in very good condition. There is less uncertainty as to the future. Consumers have of late been buying only sufficient to meet their pressing requirements, and the producer must adapt himself to this order of things. It is for his interest to do so. It was wise not to advance prices and mine less coal this month. If this had not been agreed upon we would have seen in all probability a competition among sellers resembling that of other years.

The Reading Railroad reports that its coal shipment (estimated) for last week, ending October 28th, was 295,000 tons, of which 38,000 tons were sent to Port Richmond and 35,000 tons were sent to New York waters.

A Reading dispatch says that the Reading Railroad transported 35,549 cars of coal over its main line during the month of October. This was the heaviest shipment ever made in a single month, the nearest being 35,100 cars in October, 1891. The tonnage for October, 1893, was 924,274 tons.

The Reading official circular rates, subject to the usual commissions, are as follows, f. o. b. at its New York harbor shipping ports:

	Broken.	Egg.	Stove.	Chestnut.
Hard white ash.....	\$4.00	\$4.25	\$4.60	\$4.60
Free white ash.....	3.90	4.15	4.60	4.60
Shamokin.....	4.50	4.80	4.60	4.60
Schuykill red ash.....	4.50	4.95	4.75	4.75
Lykens Valley.....	5.15	5.80	6.25	5.50

Pea, \$2.50@2.75; No. 1 Buckwheat, \$1.80@2; No. 2 Buckwheat, \$1.50@1.80.

Bituminous.

A number of vessels from the East have reached the loading ports and at the moment the soft coal trade is active. This, however, is not a criterion of the general trade. A number of season contracts has been filled now and on account of the free shipments this year consumers are pretty well supplied, making spot orders and orders for present shipment scarce. The poorer grades of coal have felt this to such an extent that shipments have been curtailed. Should prevailing conditions continue for any length

of time, the best grades will be affected in a like manner.

We hear that some concerns have been cutting into their competitors' trade in certain cases where the accepted trade-courtesy would seem to have forbidden such doings. Producers of bituminous coal unanimously say that there is very little profit in their business.

This being so, it would seem that there is not much room for the cutting of prices. So far as we can learn, the main line railroads are maintaining their schedule rates to all-rail and seaboard destinations, and, as miners' wages in the various districts remain unchanged, any reduction in selling prices will probably come from the pockets of the producers.

Cold weather is hoped for as the means of bringing some relief to the trade. All the railroads are giving very good dispatch in the transportation of coal. The car supply is good, but the railroads are discriminating in favor of those shippers who discharge their cars more promptly by giving them a bigger supply of cars than to the others.

All-rail business continues good and seems to be in a better condition as regards prices than the seaboard trade. The railroads in the case of the former branch of the business are not objecting as much as usual to the use of cars for line trade.

As stated in the beginning, numbers of vessels have arrived at the loading ports, and there has been somewhat of a scramble in chartering them, with the natural effect of advancing rates. The Vessel-Owners' and Captains' National Association's schedule of rates (published in this column two weeks ago) went into effect November 1st. Owing to the state of the market the Association has been able to keep to these rates more nearly than was anticipated a week or two ago. The lack of orders for present shipment, however, will probably prevent rates from advancing much.

The following ocean freight rates from Philadelphia are asked by the vesselmen: To Boston and Bedford, 90c.; New Haven and Bridgeport, 85@90c.; Lynn, \$1.10@1.15; Newburyport, \$1.20@1.25; Portsmouth, \$1.10; Bath, \$1.15@1.20; Gardiner, \$1.35 and towages; Bangor, \$1.35. The market is uneasy owing to the eagerness displayed by shippers in their efforts to secure vessels. The higher rates will probably have the effect of delaying shipments on some orders.

Boston.

Nov. 2.

(From our Special Correspondent.)

The action of the Vesselowners' Association in advancing rates 25 cents per ton over their old schedule has taken the snap out of business temporarily; that is, what there was. Before the new rates went into effect the vessels were very indifferent to chartering, and some even went so far as to refuse charters at the prices then ruling, preferring to wait until after the first of the month to get the advance. Now those who want coal are doing the waiting and it is very uncertain when trade will start up again. The yardmen are not as anxious to stock up this year as in former seasons, and for this reason they will probably be able to wait longer than ordinarily. It seems very improbable that the companies will advance their prices.

Companies' coals sell here on the f. o. b. basis, New York: Stove, \$4.45; egg, \$4; free broken, \$3.75; chestnut, \$4.45. Individual white ash coals can be had as follows, f. o. b. New York: Stove, \$4.25; egg, \$3.85; free broken, \$3.75; chestnut, \$4.25. Lykens Valley (at Philadelphia f. o. b.), broken, \$4.90; egg, \$5.55; stove, \$6, and chestnut, \$5.25.

There is nothing of interest to note in bituminous coal. There is very little being bought and but a limited amount is being shipped into this port on old contracts of late. The present high freight rates are to a great extent the cause of this, yet it must not be forgotten that a large number of our mills are shut down and are not using coal. The price of coal on cars here is somewhat higher than it was a week ago.

At present Cumberland is quoted \$3.75@3.80 per ton on cars; New River and Pocahontas, \$3.65@3.70; Clearfield, \$3.50@3.55.

Although vesselowners have made the advances they promised, no charters have been made at the advanced rates, so far as I could learn. It is very doubtful if vessels could be secured for less, however.

The new rates which went into operation the first of this month were: From New York, 75@80c.; from Philadelphia, \$1; from Baltimore, \$1.10; Newport News and Norfolk, \$1; to Sound points, 85c.

Tuesday and Wednesday were the only good days we have had in the retail coal market this week; all the others have been very quiet. Soft coal is moving very slowly.

Prices in this market remain very steady and are: Stove, \$6.25; nut, \$6.25; egg, \$6; furnace, \$5.75; Franklin, \$7.75; Lehigh egg, \$6.25; Lehigh furnace, \$6; soft coal, \$3.75@4.

Buffalo.

Nov. 2.

(From our Special Correspondent.)

The anthracite coal trade is quiet, with unchanged quotations. No special features to report. Country dealers are sending in their orders with more liberality than has been the case for some weeks past.

The bituminous coal trade fairly active with prices nominally unchanged, but a firmer feeling is manifested among producers and dealers. Stock of all varieties ample for trade requirements, but not enough to cause demurrage charges to accrue at the railroad yards.

Coke is quiet; price list unchanged.

The shipments of coal westward by lake from Buffalo, from October 22d to 28th, both days inclusive, aggregated 82,915 net tons distributed as follows: 27,700 tons to Chicago, 28,800 to Milwaukee, 10,000 to Duluth, 5,400 to Superior, 1,000 to Green Bay, 2,982 to Marquette, 1,000 to Racine, 1,375 to Toledo, 300 to Marine City, 1,600 to Ashland, 800 to Gladstone, 1,000 to Cheboygan and 900 to Sault Ste. Marie. The rates of freight were 35c. to Chicago, Milwaukee, Marquette, Marine City, Green Bay and Cheboygan; 50c. to Racine, Sault Ste. Marie and Menominee; 20c. to Toledo, and 15c. to Duluth, Superior, Ashland and Gladstone. Closing with light demand and upward tendency.

On Monday an advance of 10c. took place on Duluth and 15c. on Chicago and Milwaukee coal freights, with only a light inquiry for boats. A year ago 75c. was paid to Chicago and Milwaukee on November 1st as against 50c. this year.

The St. Clair & Lake Erie Ship Canal Construction Company is the name of the new corporation organized under the laws of Wisconsin to construct a canal from Lake St. Clair to Point Pelee on Lake Erie. A capital of \$4,000,000 has been subscribed awaiting a charter from the Dominion of Canada to be paid in and the work commenced.

Vessels are beginning to lay up at lake ports; freighting is not a paying business enough to warrant the risks attending the latter part of the season's navigation.

Three thousand tons of hard coal is lying under the water at Duluth caused by the giving way of 150 feet of the Lehigh Coal and Iron Company's dock.

The coal shipments by lake from Buffalo westward were 359,465 net tons for October, and aggregate 2,189,707 net tons thus far this season, a decrease this year of 155,000 net tons.

Chicago.

Nov. 1.

(From our Special Correspondent.)

The two principal events, occurring in the anthracite coal trade here, have been the appointments of new officials heads to the management of the Philadelphia & Reading Coal and Iron Company and the Lehigh Valley Coal Company. Mr. John W. Skeele, late resident manager of the Reading, has been appointed general Western sales agent of the Lehigh Valley. His chief clerk, H. H. Scott, accompanies him to the Lehigh Valley. Mr. E. B. Crosley, late line sales agent in the general manager's office of the Philadelphia & Reading, Philadelphia, has been appointed to succeed Mr. J. W. Skeele as resident manager of this company's coal business.

Anthracite, during the first three days of this week, shows rather small activity, but it is only in small lots that coal is being called for to fill current orders from consumers. Trade on the whole, either wholesale, jobbing or to retailers, is exceptionally light and can be accounted for in two ways—the continued mild weather and scarcity of money; this latter applies with equal force to dealer and consumer. There is a scarcity of all rail coal as reported by some of the shippers, one claiming to be 300 cars behind with his orders, alleging that the immense World's Fair passenger traffic has caused whole train loads of coal to be sidetracked between the mines and Chicago. Prices on small lots hold steadily at circular, though it is rather more than intimated that large lots would be shaded to suit the customer. New credits are more conservatively made than ever. City retail coal is quiet now, but the first cold snap will give dealers all they can do, and more too.

Bituminous coal is also in better demand; that is to say, some slight increases have been made in ordering additional cars on old contracts, and new business shows some improvement. There is, however, no coal going into stock, either to railroads or large dealers, and some producers of best grades of Indiana and northern Illinois coal are opposed to overtures which have been made from the latter in this regard, it being a question of extended credit, and this they discountenance. Steam coal of all kinds is very quiet, and there is a perfect glut of it in this market. Demand and orders from points west and northwest, looking to supplies from this distributing center, are slow, and yet the market continues in a healthy, not to say a strong, position, as many operators declined to burden themselves with much contract business at low summer prices earlier in the season. These, a little later on, will reap the benefit of their conservative policy in this regard.

Coke continues quiet, and while most of the foundries are taking their usual quota there is no disposition to stock. Crushed Connellsville for miscellaneous as well as domestic use is in moderate demand, and for the latter purpose the tonnage steadily increases.

Pittsburg.

Nov. 1.

(From our Special Correspondent.)

Coal.—So far as river coal business is concerned there has been nothing worthy of notice. We are still waiting for a rise, and it looks now as if the rise was waiting for the snow to fall. Two months ago the N. Y. & C. Coal Company, of Turtle Creek, which operates large coal interests in this neighborhood, notified their 800 miners that they could pay them only half cash for six months; for the other half of their wages, scrip bearing 6% interest. The proposition was accepted to relieve the company of its temporary financial stringency. On Saturday the men were taken by surprise by receiving their entire wages in hard cash up to date. The same company closed a contract for one year to furnish

the Brilliant Water Works with 200 tons of coal every 24 hours, for 4.3 cents per bushel. Coal operators declare they will hereafter deal directly with the men. Rail shipments for Cincinnati and Louisville have increased. Prices show no change.

Connellsville Coke.—In spite of the unsettled feeling in business circles the coke trade has about doubled in the past two months, and there is still a steady, but slight improvement. The firing of coke ovens has again commenced; there was a gain of 140 ovens last week. The Cambria Iron Company is making ready to fire up 300 ovens within a short time. In the past week the Mammoth, Standard and Redstone plants of the Frick Coke Company ran five days and its remaining active plants five days. The Bessemer, Buckeye and Lemont No. 2 plants of the McClure Coke Company, ran five days and its Painter plant four days; other plants ran from 4 to 6 days. The week's shipments aggregated 52,830 tons, distributed in cars as follows: To Pittsburg, 1,400 cars; to points east, 735 cars; to points west, 800 cars; total, 2,935. Pittsburg increased 150 cars; west, 65 cars; east, 35 cars; total, 250 cars. Present rates for various kinds are: Furnace coke, f. o. b. cars at ovens, \$3.35 per ton; foundry coke, f. o. b. cars at ovens, \$1.65 per ton; crushed coke, f. o. b. cars at ovens, \$1.75 per ton. Add 70c. per ton and you have the price of coke delivered at Pittsburg.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Nov. 3, 1893.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From		From	
	Nov. 4, 1892.	Nov. 3, 1893.	Jan. '92	Jan. '93.	Tons.	Tons.
Anthracite.	70	29,810	34	15,450	1,463,722	1,248,691
Coke.....	128	120,650	53	54,800	5,819,031	4,861,113
Charcoal...	43	9,640	28	5,690	451,577	349,088
Totals....	241	160,100	115	75,940	7,737,333	6,462,190

Pig Iron.—In every particular the review of the market published in this column last week applies equally well to-day, since there has been no change whatever, either for better or for worse, in the conditions which have prevailed in this market for some time past. Any review of the trade involves the repetition of statements which have been made again and again; no feature of interest has developed. The production is still being curtailed, and since stocks show no sign of a corresponding decrease, it is evident that the consumption is not increasing.

Prices continue unsatisfactory and unsteady. There is a prevailing impression that a cash offer to almost any furnace will induce concessions to the buyer, and in Philadelphia the price of No. 1 foundry has gone down openly to \$14.

The quotations which we publish herewith are as nearly correct as it is possible to get them. While it is probably true that iron may be bought for less in some instances, it would be unfair to give as a current market price figures which have been governed by especial conditions, and which in many cases cannot be obtained twice even from the same seller. The tidewater prices of the Thomas Iron Company are as follows: No. 1, \$14.50 per ton; No. 2, \$13.50; No. 3 or No. 2 plain, \$12.75. For regular brands we quote as follows: Northern brands: No. 1, \$13.75@14.25; No. 2, \$12.50; gray forge, \$12. For Southern iron we quote: No. 1, \$13@13.75; No. 2 F., \$12@12.50; No. 1 soft F., \$12@13; gray forge, \$11@12—all at tidewater. Scotch irons are quoted: Coltness, \$21.50@22; Eglington, \$19.50@20; Summerlee, \$21.50@22.

Billets and Rods.—There have been so many rumors of exceedingly low prices for billets that it is difficult, if not altogether impossible, to give quotations which shall fairly represent actual market values. Nominally, domestic billets may be quoted at \$18@20, and foreign billets \$28@29, tidewater. Wire rods, domestic, \$28@29; foreign, \$39@40, tidewater.

Manufactured Iron and Steel.—We do not hear of any noteworthy sales in this market. There is little of interest doing and prices continue without much change. We quote Angles, 1.75@1.9c.; axes, scrap, 1.80@2.1 delivered; steel, 1.75@2c.; bars, common, 1.40@1.50c.; refined, 1.50@1.85c. on dock; beams, up to 15 in., 1.70@2c.; 20 in., 2.00@2.25c.; car truck channels, 2@2.10c.; channels, 1.85@2c. on dock; steel hoops, 1.8@1.9c., delivered; links and pins, 1.70@1.80c.; plates, flange, 2@2.10c.; firebox, 2.5@2.8c.; flange, 2.10@2.25c.; marine, 2.50@2.75c.; sheared, 1.85@2.10c.; shell, 1.75@1.95c.; tank, 1.65@1.85c.; universal mill, 1.70@1.90c., tees, 2@2.15c., all on dock.

Merchant Steel.—There is nothing new to report of this market, which continues quiet, with prices as last reported. We quote: Tool steel, \$6.50@6.75 and upward; tire steel, \$2@2.10; toe calk, \$2.30@2.40; Bessemer machinery, \$2.10@2.20. Bessemer bars, \$1.60@1.70; open hearth machinery, \$2.25@2.30; open hearth carriage spring, \$2.10@2.20; crucible spring, \$3.75@4.

Old Material.—There is little of any consequence doing in this market. A few small sales are reported, among them being: 150 tons of old steel rails at \$10, f. o. b. cars Jersey City; 200 tons of No. 1 wrought scrap \$10, f. o. b. cars Jersey City; 150 tons railroad scrap at \$13, delivered at mill; 50 tons of old car wheels at \$12, and 200 tons of wrought turnings at \$9.50, delivered at mill.

Rail Fastenings.—The market for rail fastenings continues very dull. Quotations remain nominally: Fish and angle plates, \$15@15.80 at mill; spikes, 1.80@1.90c.; bolts and square nuts, 2.45@2.50c.; hexagonal nuts, 2.55@2.60c., delivered.

Spiegeleisen and Ferromanganese.—There is little doing in either ferro or spiegel. Quotations are nominally as follows: 10 to 12% Spiegel, \$22@22.50; 20% \$25@25.50. Ferro, \$50@57.

Steel Rails.—There is nothing new to report of the rail market. It continues very quiet. The only topic of interest is the continued talk of lower prices which have been made lately. Quotations here are still nominally \$29 at mill.

Tubes and Pipe.—We do not hear of anything of importance in this market; it continues quiet. Ruling discounts on carload lots are as follows: Butt, black, 57½, 10 and 5%; butt, galvanized, 50, 10 and 5%; lap, black, 67½, 10 and 5%; lap, galvanized, 57½, 10 and 5%.

Buffalo. Nov. 2.

(Special Report of Rogers, Brown & Co.)

Some evidences are seen of larger consumption, but very few consumers of iron are sanguine of any very material change for the better in their business in the near future. This disposition materially affects the amount of their purchases, although their predictions may prove incorrect. At present the general run of orders continues to be for carloads, with an occasional one for 200 or 500 tons. We quote for cash f. o. b. cars Buffalo: No. 1 X foundry strong coke iron, Lake Superior ore, \$13.50; No. 2 X foundry strong coke iron, Lake Superior ore, \$13; Ohio strong softener No. 1, \$13.75; Ohio strong softener No. 2, \$13.25; Jackson County silvery No. 1, \$16.80@17.30; Jackson County silvery No. 2, \$16.30@16.80; Lake Superior charcoal, \$15.75; Tennessee charcoal, \$16; Southern soft No. 1, \$13.15; Alabama car wheel, \$18; Hanging Rock charcoal, \$20.50.

Chicago. Nov. 1.

(From our Special Correspondent.)

It is apparent to the most superficial observer that there is no improvement in the iron trade at this center. If anything it is a little quieter than the previous week in crude iron, that is so far as new business is concerned. Probably the most important feature in the situation in this connection is the fact that never before has a crisis been followed by a market so bare of finished material. Hence it is safe to say that resumption in many industries into which iron and steel largely enter may be forced by the consumptive necessities.

Pig Iron.—Local coke foundry iron is quieter, and new orders during the past week have been confined almost exclusively to carloads, and as these have been frequent, it evidences the fact that stocks in foundry yards are at a low ebb. There is no inquiry for large lots, and consumers generally have adopted the hand to mouth policy, this being particularly noticeable in outside foundries. Southern coke iron is extremely dull, and with the one exception of 500 tons, the carload trade has been a conspicuous feature. Indications now point to a continued dullness for some time, and unless the market improves materially in the very near future more furnaces in the South mill go out of blast. Prices are still very irregular, according to condition of stocks at furnaces. A few small orders have been placed for Lake Superior charcoal iron at \$14. This iron is part of 6,000 tons held by banks against advances: Quotations per gross ton f. o. b. Chicago are Lake Superior charcoal, \$16.00@16.50; Lake Superior coke, No. 1, \$13.50@13.75; No. 2, \$12.75@13.25; No. 3, \$12.25@12.50; Lake Superior Bessemer, \$14.00; Lake Superior Scotch, \$14@14.50; American Scotch, \$15.50@16.00; Southern coke, foundry, No. 1, \$13.50; No. 2, \$12.00; No. 3, \$11.50; Southern coke soft, No. 1, \$11.75; No. 2, \$11.50; Ohio silveries, No. 1, \$16.50; No. 2, \$16.00; Ohio strong softeners, No. 1, \$16.25; No. 2, \$15.75; Tennessee charcoal, No. 1, \$16.50; No. 2, \$16.00; Southern standard car wheel, \$18.25@18.75.

Structural Iron and Steel.—The Calumet Club Building is in the market. It will be skeleton steel construction, requiring some 250 tons of beams, columns and electro-bronze work. Prices are so cut by exclusive competition that profits are out of sight in the heavier building lines. Quotations, car lots, f. o. b. Chicago, are as follows: Angles, \$1.70@1.80; tees, \$1.95@2.05; universal plates, \$1.70@1.80; sheared plates, 75c.@1.85; beams and channels, \$1.75@1.85.

Plates.—There is no large business coming up and mill agents are not pushing for what there is at current rates. Warehouse trade is only fair and prices easy. Steel sheets, 10 to 14, \$2.25@2.35; iron sheets, 10 to 14, \$2.20@2.30; tank steel, \$1.90@2; shell iron or steel, \$2.50@2.75; firebox steel, \$4.25@5.25; flange steel, \$2.74@3; boiler rivets, \$4@4.15; boiler tubes, all sizes 65%.

Merchant Steel.—Small orders continue a feature, and a fair tonnage was closed during the week. The buying movement is moderately active with quite a number of factories yet to hear from. The only trouble is the withholding of specifications on contracts already placed. Quotations are: Tool steel, 6.50@6.75c. and upward; tire steel, 1.85@1.90c.; toe calks, 2.20@2.30c.; Bessemer machinery, 2.05@2.15c.; Bessemer bars, 1.70@1.80c.; open hearth machinery, 2.10c., open hearth carriage spring, 2.10@2.20c.; crucible spring, 3.50@3.75c.

Galvanized Sheet Iron.—Mill orders have been made active, and agents report a continued good

demand from warehouse in 10 to 20-bundle lots. Discounts are easier at 70, 10 and 7½% off on Juniata and 70, 10 and 10% off on charcoal and jobbing quantities at 70 and 7½% off on the former and 70 and 10% off on the latter.

Black Sheet Iron.—Jobbers complain that deliveries are very much behind on contracts placed last summer. New business in mill lots is very quiet at 2.70@2.75c. for No. 127 common. Jobbers quote 2.95@3c. for same gauge for iron, and steel sheets are about 10c. higher per 100 lbs.

Bar Iron.—There is only a moderate demand from miscellaneous consumers, but the implement makers continue to contract, though they are slow to give out specifications. Prices are easy at 1.40c. rates on mill lots. Jobbers note a fair demand from stock at 1.60@1.70c. for iron and steel bars.

Billets.—Further inquiry and demand is reported for billets at \$20. Nothing doing in steel ends.

Steel Rails.—Orders in lots of 200 to 500 tons continue a feature at \$30@31. The steel company here anticipates no improvement until early next year.

Nails.—Wire nails are lower at \$1.32½ and demand fair in mill lots. Jobbers quote \$1.50 and movement slow. Steel cut nails are quiet from factory at \$1.20 base; jobbers quote \$1.35 in small quantities from stock.

Scrap is accumulating on makers' hands, dealers buying to fill orders only and prices nominal. Railroad, \$11.00; No. 1 forge, \$11; No. 1 mill, \$7.50; fish plates, \$12; cast borings, \$4.50; wrought turnings, \$7.50; axle turnings, \$7.25; machinery castings, \$9; stove plates, \$6.50; mixed steel, \$7; coil steel, \$14; leaf steel, \$14; tires, \$13.50.

Old Material.—Iron rails are nominal at \$14; some holders want \$16 to \$18. Steel rails are selling more freely at \$10@12.25, according to length, etc. Car wheels are hard to move at any price; nominally \$12.

Philadelphia. Nov. 2.

(From our Special Correspondent.)

Pig Iron.—The pressure this week to sell developed unexpected weakness, depressing No. 1 to an average of \$14, although some few makes could not be had at that price. No. 2 was taken at \$13, and Standard Forge at \$12.50. Developments are hourly expected. Big sales for winter delivery are expected.

Muck Bars.—Dull at \$22.25.

Steel Billets.—Sellers declare the market is firmer because sales were made at \$20.50@20.75, but buyers assert they know where to get large lots at \$20. The truth of this cannot be asserted. There is more stir in the market.

Merchant Iron.—No special features. No greater production; prices where they were. No large lots are selling. Quotations, 1.45@1.60.

Skelp.—One or two large orders are again expected.

Pipes and Tubes.—Better conditions are developing; but, while business is on the eve of improvement, there will be no great expansion.

Sheets.—Heavy sheets are selling to supply construction requirements in progress. Buyers are not anticipating. Millmen look for stronger prices soon.

Nails.—Offers are made both here and in the East, but no large lots have been worked off here yet.

Tank and Plate.—The week's business is light and manufacturers are not hopeful of much increase. Shell, 1.70; flange, 1.90; tank, 1.55.

Structural Material.—The mills cast have not lessened production, nor have they increased, as was hoped they would by this time. There is much business in sight, but those who control it are waiting.

Steel Rails.—Steel rail quotations have not meant anything for months past, so that whether \$28, \$27 or \$26 is quoted, nothing is fixed, simply because there are no buyers for large lots, and probably will not be until the new duties are fixed.

Old Rails.—Many more are to be had than are taken. Quotations are ordinarily \$14.

Scrap.—No. 1 is plenty at \$12.

Pittsburg. Nov. 2.

(From our Special Correspondent.)

Raw Iron and Steel.—The condition of the market for iron and steel products has undergone but little change since the date of our last report; the volume of business is larger, however, and sales more numerous, and, taken as a whole, it certainly looks as if daylight was drawing near. The increasing stocks of unsold iron at the furnaces, notwithstanding the low rate of output and the fact that conservative buying is likely to continue for some time to come, has led a few producers to name even lower figures than have recently prevailed without stimulating consumers to take any considerable quantity in excess of what they actually require to meet pressing demands. The general run of orders for months past has been of this hand-to-mouth character, and the mills and foundry have cleaned up their stock of material on hand so close that the market for crude iron is likely to promptly respond to any improvement in the industrial situation. Manufacturers are encouraged at the turn taken in silver legislation, but the depression in the market has been so great that very little change is looked for until after the beginning of the new year.

Pig Iron.—This department of the iron trade does not show the reactionary movement which was generally expected. The large falling off in consumption since the first of July has more than offset the curtailment in production, so that with an output not much more than a third of what it was some time ago there is still a supply in excess of the demand. The following tables will furnish all the necessary information, showing a wide range in prices:

Coke Smelted Lake and Native Ore.	1,000 Billets, Nov.	18.00
	750 Billets, Nov.	18.15
	600 Billets, Nov.	18.20
	Muck Bar.	
1,000 Bessemer, Nov.	1,000 Neutral	21.00
1,000 Bessemer, Nov.	500 Neutral	21.15
1,000 Bessemer, Nov.	300 Neutral	21.00
1,000 Bessemer, Nov.	250 Neutral	21.25
1,000 Bessemer, at City	250 Neutral	21.00
Furnace	180 Neutral	21.00
700 Bessemer, Nov.	Skelp Iron.	
700 Gray Forge, Nov.	400 Wide Grooved	1 35 4 m.
500 Gray Forge, Nov.	375 Narrow Grooved	1 35 4 m.
400 Gray Forge, Nov.	325 Sheared	1 47 1/2 4 m.
300 Gray Forge, Nov.	Skelp Steel.	
200 Gray Forge, Nov.	375 Wide Grooved	1 30 4 m.
150 Gray Forge	Charcoal.	
100 Mill	50 Cold Blast	\$26.00
100 Gray Forge, all ore	50 Cold Blast	25.50
300 No. 2 Foundry, all ore	25 Hot Blast Fnd'y.	18.25
200 No. 1 Foundry, all ore	Sheet Bars.	
100 No. 2 Foundry, all ore	300 Tons, at mill	21.00
50 No. 1 Silvery	Blooms, Billets and Slabs.	
50 No. 2 Silvery	500 November	12.50
Blooms, Billets and Slabs.		
1,500 Billets, Nov., Dec., at mill	300 Old Iron Rails	15.00
1,200 Billets, next two months, at mill	200 Old Steel Rails	12.50
1,000 Billets	200 Old Iron Rails	16.00
1,000 Billets	200 Mixed Lengths	11.50
1,000 Billets	110 Short Steel Rails	12.50

METAL MARKET.

NEW YORK, Friday Evening, Nov. 3, 1893.

Prices of Silver per Ounce Troy.

Oct.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.	Nov.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.
28	1 83 1/4	33 1/4	71 1/4	56 1/2	1	4 83 3/4	31 1/4	68	54 1/2
30	1 83 1/4	32 3/4	69 3/4	55 1/2	2	4 83 3/4	32	69	55 1/2
31	1 83	31 1/2	63	54 1/2	3	4 83 3/4	32	69	55 1/2

In sympathy with the repeal of the Sherman law the London market declined on the absence of buyers to 31 1/2 d. with little business. On a revival of orders the market closes steady at 32 d. The question of the future range of prices now will depend partly on production and partly on the Eastern demand.

The United States Assay Office at New York reports the total receipts of silver for the week to be \$3,000 oz.

Gold and Silver Exports and Imports at New York, Week Ending October 28th, 1893, and for Years from January 1st, 1893, 1892.

Week	Gold.		Silver.		Excess of Ex. or Imp.
	Exports.	Imports.	Exports.	Imports.	
1893...	\$24,000	\$352,417	2,596,160	\$74,744	E \$192,999
1892...	70,173,547	58,296,787	26,335,278	3,061,080	E 3,150,958
1892...	59,047,353	7,528,136	17,727,950	2,674,416	E 66,572,751

The gold exported for the week went to the West Indies; the silver to London. The imports, both of gold and silver, were from Mexico, the West Indies and Central America. The gold imports exceeded the exports by \$328,417. In the above statement bullion in transit simply is not included.

During the five days ending November 2d the exports and imports have been as follows: Exports, gold, none; silver, \$298,260. Imports, gold, \$272,002; silver, \$2,491. Of the silver exported, \$31,900 was in Mexican bullion, \$18,960 in South American coin; all the rest was American bullion and coin. Of the total \$279,300 went to London, and \$18,960 to South America.

During the past week the Sub-treasury at New York took deposits amounting to \$680,000 on telegraphic orders of payment to be made at New Orleans, La.

The offers of silver to the Treasury October 30th were 737,000 oz., of which 50,000 oz. were bought at 70 cents, and the same price was tendered for the rest but not accepted. On November 1st 84,000 oz. were offered at 70 cents, but rejected, and a counter offer of 68 1/2 cents made. This was the last silver offered under the law, the repeal taking effect November 2d.

NOTES OF THE WEEK.

When we last wrote it was apparent that the end of the long contest over the repeal of the silver purchase clause of the Sherman act was approaching, but it was not quite clear just when it would come. Events moved more rapidly, however, than was

perhaps expected, and on Monday, October 30th, the bill, which was passed by the House on August 29th and came before the Senate on the following day, or just two months before, was finally passed by a majority of 11. 43 Senators voting in its favor and 32 against it. On the last day there was still some debate and some bitterness was manifested by the silver minority. No active resistance was made, however, to the order for a vote. On the following day the bill went back to the House, this action being made necessary by the Voorhees amendment which had been added to it in the Senate, and which is simply a declaration of the intention of the United States to keep silver and gold money at a parity. Immediate action was prevented by an objection interposed by Mr. Bland, which sent the consideration of the bill over until the following day. On November 1st the bill was taken up and, after three hours' debate, in which Bland, Bryan and a few other silver men put in their closing words, the previous question was ordered and the bill as amended was finally passed by a vote of 192 to 94, or very nearly the same majority which it received on its first passage in the House. The slight attempt made at delay came to nothing. The engrossed copy was promptly sent to the President, who at once signed it, making it a law, and on November 1st the silver purchases under the Sherman act, which have done so much harm to the business of the country, came finally to an end.

While the good results of the final repeal are already becoming apparent, the first effect in the New York stock market was a decline. This, however, was due entirely to the extent to which repeal had been discounted, after the fashion of Wall Street. Some slight improvement has already been made and a further one is expected to follow.

The treasury circulation statement issued November 2d states the per capita circulation at \$25.49, an increase of 20 cents per capita during the month of October. The general stock of all money coined and issued in the United States is placed at \$2,204,651,000, of which \$486,106,318 is in the Treasury and \$1,718,544,682 is in circulation.

The latest statement of the New York banks shows increases of \$6,146,700 in surplus reserve; \$3,285,100 in loans; \$346,000 in specie; \$8,194,400 in legal tenders; \$11,574,800 in deposits, and a decrease of \$79,700 in circulation. The reserve was \$48,787,475 in excess of legal requirements. The increase in loans, though comparatively small, is one of the signs of returning confidence.

The last of the Clearing House certificates issued by the New York Clearing House were retired on Wednesday, November 1st, and on the following day the Loan Committee submitted its final report at a special meeting. From this it appears that the first issue was made June 17th; the total issue was \$41,400,000, and the greatest amount outstanding at one time was \$38,280,000, on August 29th. The amount of collateral received by the Committee was \$56,000,000, of which 72% was in bills receivable and 28% in stocks and bonds. The amount of interest paid on certificates was \$535,513. The percentages of loan certificates used in payment of balances have been: In June, 9%; in July, 78%; in August, 95%; in September, 30%; the total of certificates thus used being \$299,273,000. The report further says: It has been frequently stated, and feared by some, that the amount of certificates issued during the present crisis was in excess of the amount issued, in proportion to the deposits held by the banks, during any previous panic. On examination of the figures, however, we find that this has not been the case, as in 1873 the deposits were \$152,640,000, and loan certificates \$22,410,000, being 14 7/8%; in 1884, on deposits of \$236,575,300, certificates were issued to the amount of \$21,885,000, being 9 1/8%; in 1890, on deposits of \$376,746,500, a total of \$15,205,000 certificates were issued, being 4%; in 1893, \$374,010,100 deposits, certificates \$38,280,000, being 10 1/2%. The greatest amount of certificates, in proportion to deposits, was issued in 1873. Had the same proportion of loan certificates been issued in 1893 as was issued in 1873, the amount would have reached the sum of \$55,000,000.

We noted last week the shipment of \$500,000 gold from London to New York for account of Lazard Freres. This was followed on Tuesday of this week by \$500,000, and on Wednesday by \$500,000 more, while on Thursday shipments of \$300,000 from London and \$100,000 from Paris were reported, making a total of \$1,900,000, all for the same house. The shipments have been helped by a decline in the price of gold, the Bank of England on Monday having reduced the selling price of eagles to 7s. 9d. Bar gold in London on Thursday was 77s. 11 1/2 d., from 78 d. to 79 d. below last week's price.

The United States Treasury statement on Thursday, November 2d, shows total balances of \$96,732,073 in excess of outstanding certificates, made up of \$84,384,862 gold, \$7,966,314 silver, \$2,463,987 legal tenders and \$1,916,910 treasury notes, etc. For the week, the total balance shows a decrease of \$453,470, but the gold increased \$754,877, at the expense of a decrease in legal tenders and silver.

Silver dollars and hullion on hand in the Treasury under the act of July, 1890, amounted on the same date to \$152,735,183, against which were the same amount of treasury notes outstanding.

The United States Treasury statement for October and the four months of the current fiscal year, to October 30th, is as follows:

	October.	Four months.
Customs	\$10,999,531	\$50,397,903
Internal revenue	12,736,109	49,457,894
Miscellaneous	817,454	4,077,015
Total receipts	\$24,553,094	\$104,932,812
Disbursements	29,588,792	128,019,486
Excess of payments	\$5,034,598	\$24,086,674

As compared with the corresponding period last year the receipts show a decrease of \$26,946,746, or 20 1/2%. Of this \$18,655,425 was in customs. The payments show an increase of \$669,498. The Treasury has thus been running behind and reducing its balances at the rate of some \$6,000,000 a month.

The statement of the Comptroller of the Currency for October shows that the national bank notes outstanding October 31st amounted to \$209,214,166; an increase of \$621,904 during the month, and of \$36,886,992 since October 31st, 1892. During the year there was therefore an increase of 2 1/4% in national bank circulation.

The Mint statement of coinage for the month of October is as follows:

	Coins.	Value.
Double eagles	68,000	\$1,360,000
Eagles	56,820	5,682,000
Half-eagles	515,320	2,576,600
Total gold	1,140,140	\$9,504,800
Half-dollars	441,000	220,500
Quarter-dollars	388,000	97,000
Dimes	1,009,000	100,900
Total silver	1,838,000	\$19,000
Five cents	800,000	40,000
One cent	4,010,000	40,100
Total minor	4,810,000	\$80,100
Total coinage	7,782,140	\$10,003,900

The mints during the month were devoted almost entirely to gold, the amount produced being the largest coinage of gold in any month of recent years. The silver work was confined chiefly to re-coinage of worn and light weight pieces.

The Bank of England statement for the week ending with Thursday showed net exports of gold amounting to £717,000. The total exports were £419,000 to the continent, £295,000 to Egypt and £202,000 to the United States, while the receipts were light, £17,000 from Portugal, £50,000 from Montevideo and £132,000 from Australia. The Bank's gold holdings are now £24,976,774, an increase of £547,521 over the corresponding date last year.

The exports of gold from London to the Continent continue large. Part of this is accounted for by the demand for Austria, that country still taking gold wherever possible, as we explained recently. Some large shipments made nominally to Holland are not explained, but it is believed that at least a part is on Russian account.

Some buying of silver in London for shipment to India and China is reported, causing a slight recovery in the price.

The Bank of France, on Thursday, November 2d, reported its specie holdings in sterling at £67,938,789 gold and £50,550,137 silver, an increase of £1,019,541 gold and a decrease of £527,469 silver, as compared with the corresponding date last year.

The late excitement over the Russian alliance in France is being followed up, it is said, by increased French investment in Russian loans, but this has had no noticeable effect on the Bank's specie reserves as yet. A recent article by M. Neymarck, who is a good authority, estimates the total amount of Russian loans now held in France at from \$1,000,000,000 to \$1,200,000,000, the high interest being the main reason.

The London "Economist" of latest date received reports the total amount of India Council bills sold from the closing of the Indian mints on June 29th to October 21st at less than one-sixth of the amount offered. The sterling realized this year has been £5,850,471 against £3,423,606 in the corresponding period last year. The "Economist" says: There is no change whatever in the position of the market for India Council bills. Another 40 lacs were offered on Wednesday last, and there were again no applications. At the end of last week the exchange was so strong that it looked likely that the Council might possibly be able to sell a few bills; but before the allotment exchange had again weakened, and with the banks able to buy merchants' demand bills at 1/4 d. over 1s. 3d. per rupee, they, of course, could not pay 1s. 3 1/2 d. for Council drafts.

Domestic and Foreign Coins.

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

	Bid.	Asked.
Mexican dollars	\$50 3/4	\$50 3/4
Peruvian soles and Chilean pesos	54	54
Victoria sovereigns	4 8 1/2	4 8 1/2
Twenty francs	3 6	3 8
Twenty marks	4 7 1/2	4 7 1/2
Spanish 25 pesetas	4 7 1/2	4 8

The Peruvian House of Deputies has approved several clauses of the monetary or currency reform bill now under consideration. These clauses abolish the export duties on silver, require the payment of 25% of all import duties in gold coin, and provide that Peruvian silver coin only shall be legal tender, to the exclusion of all foreign coin.

Other Metals.

The repeal of the Sherman act was hailed with delight by the entire business community, and it is to be hoped that business, which up to the present has been so unsatisfactory in all the different branches, will now resume its usual proportions. The slight improvement which has so far been noted was mainly on the Stock Exchange, but the actual trade still leaves a great deal to be desired, which, after the depression during the last few months, can hardly be wondered at.

Copper.—There has been a slightly better demand from consumers, and some business was done in Lake copper at 9 1/2 @ 9 3/4; the latter only in an exceptional case, but the quantities contracted for are too small to influence prices. Europe continues to inquire for copper, but consumers there will not pay any higher prices than they did recently, and consequently only a few small sales have been effected. The exports of all descriptions of copper during the month of October will probably be as large as those of September. We quote for Lake copper 9 1/2 @ 9 3/4. Electrolytic copper 9 1/2 @ 9 3/4. Casting copper 9 1/2 @ 9 3/4, with only limited transactions.

The market for G. M. B. Copper in London has ruled without many fluctuations, and closes £12 5s. for spot, and £12 15s. three months. For refined and manufactured we quote: English tough, £44 15s. @ £45; best selected, £45 @ £45 5s.; strong sheets, £53 @ £54; India sheets, £50 @ £51; yellow metal sheets, 4 1/2 d.

It is reported that large quantities of copper are piled up at the manufacturers' works or at the railroad depots. We are informed by cable that the statistics for the second half of October have increased 900 tons.

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

Destination	Plates	Ingots	Tons
Bremen—Elbe	20	100	75
Liverpool—Herriot	75	25	25
" " " " "	25	110	45
Havre—La Champagne	110	25	25
Swansea—Wells City	45	70	10
Lezhorn—Hesneria	25	10	20
Liverpool—Teutonic	70	120	10
Hamburg—Dania	10	250	22
" " " " "	20	95	10
" " " " "	120	250	22
Liverpool—Barrowmore	10	25	25
Hamburg—Scandia	25	95	10
Antwerp—Sorrento	10	15	255
London—Mobile	15	98	50
Bordeaux—Chateau Lafitte	12	25	25
Rotterdam—Loch Lomond	50	25	25
Liverpool—Germanic	25	83	8
Rotterdam—Edam	25	8	10
Antwerp—Herrmann	10	10	10
Hamburg—Marala	10	40	20
" " " " "	20	89	10
Stettin—Virginia	10	20	89
Hull—Galileo	10	10	130
Copper Mate:			55
Liverpool—Nomadic			105
Swansea—Wells City			
Liverpool—Campania			

The exports of copper from Baltimore for the week ending November 2d were as follows:

Destination	Quantity	Weight
Copper:		
Liverpool—Barrowmore	560 bbls.	560,000 lbs.
" " " " "	278 cakes	48,983 "
Hamburg—Scandia	1,619 ingots	42,920 "
" " " " "	11 casks	209,155 "
" " " " "	742 cakes	146,000 "
" " " " "	146 bbls.	319,800 "
Antwerp—Belgium	21,081 ingots	34,022 "
" " " " "	110 cakes	22,400 "
Liverpool—Queensmore	148 cakes	21,446 "
" " " " "	18 bbls.	18,200 "
" " " " "	31,675 ingots	449,936 "
" " " " "	187 bars	37,586 "
Copper matte:		
Liverpool—Queensmore	4,350 sacks	455,791 "

Tin was rather flat the beginning of the week. Owing to the decline in silver and the consequent lower prices for tin in London, lower quotations ruled there, and spot tin was quoted down to £76 10s., and £77 for three months. Since then a slight reaction has set in, and the closing prices are £77 5s. for spot, and £77 15s. three months. There were several lots of tin in this market, which were tendered for delivery on the 1st. This depressed the market, and sales were made as low as 20.45, but after this a much better demand set in, and the closing prices are 20.75 for spot and November tin, and 20 1/2 for December.

Lead.—Lower prices have been accepted. The main business done was at 3:40 @ 3:45, while the official quotation is 3:30. Consumption appears to have been better than for some time past. The foreign market is rather stronger, with Spanish lead quoted at £9 13s. 9d. @ £9 16s. 3d., and English lead 2s. 6d. higher.

St. Louis Lead Market.—The John Wahl Commission Company telegraph us as follows: The temporary boom of last week seems to have entirely collapsed in the last few days. Several hundred tons sold at 3:17 1/2 @ 3:20c. To-day a round lot would have to be shaded at less than this. The market closes in a badly demoralized condition.

Spelter is in decidedly better demand. Stocks are light, and the curtailed production makes itself felt. Several transactions took place here yesterday at 3:65 for prompt shipment from St. Louis, and 3:70 for late November delivery. The foreign market is cabled as being slightly better; good ordinary, £17, and specials, £17 2s. 6d.

Antimony remains very dull. Cookson, 10c.; L. X., 9 1/2, and Hallet's, 9 1/2 @ 9 3/4.

Aluminum.—The prices, as at present fixed by the manufacturers, are for 96% pure, 65c. per lb.; 98%, 75c.

Quicksilver.—The market here continues unchanged at \$38. In London the market is weaker; quotations there are £8 7s. 6d.

Nickel.—This metal is quoted at 45 @ 55c. per lb., according to grade.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Nov. 3.

Heavy Chemicals.—In no particular has there been a change since our last report in the conditions prevailing in the heavy chemical market and reported in this column last week. The position of the various chemicals has in no wise been altered. Prices also continue unchanged. Caustic soda is quiet and in light supply. For alkali and carbonated soda ash there has been some inquiry. Special attention is called to our Liverpool report; it covers the ground almost as well here as it does there.

Quotations are nominally as follows: Caustic soda, 60%, 3:05 @ 3:20c.; 70%, 2:80 @ 3c.; 74%, 2:82 1/2 @ 3:05c.; 76%, 3 @ 3:10c. Carbonated soda ash, 48%, 1:15 @ 1:25c.; 58%, 1:10 @ 1:20c. Alkali, 48%, \$1.10 @ \$1.20; 58%, \$1.05 @ \$1.15, according to package. Sal soda, English, 1:10c.; American, 1 @ 1:10c. Bleaching powder, 2:25 @ 2:50c.

Acids.—Nothing of interest has occurred in this market since our last report. On the whole business in acids is quiet and devoid of features bearing especial significance. We quote acids, per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, in barrels, \$1.87 1/2; in carboys, \$2.25; muriatic, 18", 90c. @ \$1.10; 20", \$1 @ \$1.25; 22", \$1.10 @ \$1.35; nitric, 40", \$4; 42", \$4.50 @ \$4.75; sulphuric, 75c. @ \$1. Mixed acids, according to mixture, oxalic \$6.30 @ \$6.50. Blue vitriol is quoted all the way from \$3 5/1 to \$3.75; glycerine for nitroglycerine, 11 1/2 @ 12 1/2c., according to quality and quantity.

Brimstone.—Some business has been done during the past week. Prices are slightly lower than last reported and we quote December-January shipments, best unmixed seconds, \$17 1/2; thirds, 75c. less. Near due, best unmixed seconds, \$18; best thirds, \$17 1/2.

Messrs. Mortimer & Wisner, the well-known brokers of this city, send us their monthly statement of nitrate, issued under date of November 1st:

	1893.	1892.	1891.
Imported into A. ports f. West Coast S. A., Jan. 1, 1893, to date	589,625	571,456	577,492
Imported into Atlantic ports from Europe	16,712		18,802
Stock in store and afloat Nov. 1, New York	606,337	571,453	596,294
Boston	44,425	70,148	67,098
Philadelphia		821	800
Baltimore		1,000	1,000
To arrive, actually sailed	257,000	139,000	122,000
Visible supply to Dec. 1:	305,925	170,969	190,998
Additional charters	144,000	180,000	200,000
Total supply, when shipped	449,925	350,969	390,998
Stock on hand, Jan. 1, 1893.	15,454	53,585	36,454
Deliveries past month	20,382	62,400	61,405
Deliveries Jan. 1 to date.	572,866	593,072	563,750
Total yearly deliveries	685,158	685,158	685,158

Included in the deliveries of 1893 are 9,500 bags shipped to European ports.

Fertilizing Chemicals.—A fair business has been done in this market during the past week. There has been a fair inquiry, and some sales are reported. The demand from the South has been quite lively, owing probably to the firmness in the cotton market. Now, with the repeal of the purchasing clause of the Sherman act, the banks will be more willing to advance money to the farmers and a better business will be done in fertilizers. Prices show no change of importance. We quote this week: Sulphate of ammonia, on the spot, gas liquor, \$3.50 @ \$3.55; none, \$3.25 @ \$3.30. Dried blood, \$2.70 @ \$2.80 per unit for high grade, and \$2.40 @ \$2.50 for low grade. Azotine, \$2.70 @ \$2.75. Concentrated phosphate (80% available phosphoric acid), 75c. per unit. Acid phosphate, 13% to 15%, av. P₂O₅ 60c. per unit at seller's works in bulk. Dissolved bone-black, 17% to 18%, P₂O₅ 90c. per unit. Acidulated fish scrap, \$15 @ \$16, and dried scrap \$25 @

\$25.50 f. o. b. fish factory; wet scrap, \$15 f. o. b. fish factory. Tankage, high grade, \$20 @ \$27; low grade, \$22 @ \$23. Bone tankage, \$23 @ \$24; bone meal, \$24 @ \$25.50.

The price of double manure salts as fixed by the syndicate is as follows: New York and Boston, \$12; Philadelphia, \$11 1/4; Charleston and Savannah, \$1.17 cwt., basis 48 @ 50%, in 50-ton lots on foreign weights and analyses. Sulphate of potash, 90% - 96% basis 90%; New York and Boston, \$2.07, Philadelphia, \$2.09; Charleston and Savannah, \$2.127, sulphate of potash, 96-99% basis 90%, is 4% higher.

Phosphates.—Quotations f. o. b. vessels or cars Charleston are \$4.50 for crude rock, and dried, \$5.25.

Nitrate of Soda.—This market is quiet. Quotations for spot are \$1.87 1/2 @ \$1.90, according to quantity; shipments according to position.

Liverpool.

Oct. 25.

(Special Correspondence of Joseph P. Brunner & Co.) Since our last advices the position as regards the coal strike remains practically unchanged, as both masters and men decline to give way. There is very little to report as regards heavy chemicals, business being only of a retail character.

Soda ash continues dull, and for Le Blanc makes quotations are quite nominal, varying according to quantity, make, market, etc., and may be taken about as follows: Caustic ash 48%, £4 2s. 6d. @ £4 10s. per ton; 57%, 58%, £4 12s. 6d. @ £5 2s. 6d. per ton. Carbonate ash, 48%, £4 5s. @ £4 10s. per ton; 58%, £4 15s. @ £5; all net cash. Ammonia ash, 58%, is unaltered, being still quoted at £3 15s. @ £4 per ton, less 2 1/2%. Soda crystals are in fair request and steady at £3 5s. @ £3 7s. 6d. per ton, less 5%.

Caustic Soda.—There has been rather more inquiry this week, but as there is next to nothing to be had on this market except one or two odd parcels in second hands for which prohibitory figures are asked, there is nothing going on. Quotations on the Tyne have been advanced, but are still very much under figures quoted here, which are about £9 15s. @ £10 for 60%, and £10 15s. @ £11 for 70%.

Bleaching powder is flat, and resale parcels are pressed for sale. Nominal quotations range from about £3 7s. 6d. to £8 15s. per ton net cash, for hardwood casks.

Chlorate of potash is idle, and prices have drooped still further. Owing to absence of business it is difficult to test values, but 8d. @ 8 1/2d. may be quoted about nominal range for prompt and November delivery, while for November-December there are sellers at 7 1/2d. @ 8d. For all 1894, we quote 7 1/2 @ 7 3/4d. per lb. less 5%.

Bicarb. soda is selling to a fair extent at £7, less 2 1/2% for one cwt. kegs, with usual allowances for larger packages. Sulphate of ammonia in small compass and values may be quoted at £13 5s. @ £13 10s. per ton, less 2 1/2%, for good gray 24 @ 25% in double bags, f. o. b. here. Nitrate of soda is quiet at £9 7s. 6d. @ £9 12s. 6d. per ton, less 2 1/2% for double bags, f. o. b. Liverpool, according to quality.

Carb. Ammonia.—Lump 3 1/2d. per lb.; powdered, 3 1/4d. per lb., less 2 1/2%.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburg, St. Louis, London and Paris, see pages 48, 49 and 49.]

NEW YORK, Friday Evening, Nov. 3.

There has been rather more inquiry for mining stocks during the past week. Advices from San Francisco continue favorable, that is to say, the indications are said to portend another "boom" in the Comstocks. We have no doubt that with our brokers the wish is father to the thought. Whether Mr. Rule finds anything or not in the California & Virginia mine it seems certain at this writing that the "insiders" in the pending deal will not fail to profit. At whose expense they will do so is another question.

Consolidated California & Virginia was the most active of all the Comstocks. According to the official lists of the Consolidated Stock and Petroleum Exchange the total sales aggregated 1,020 shares at \$2.60 @ \$3.80, the latter price having obtained at the close. Ophir advanced from \$1.40 @ \$1.85; total sales, 500 shares. Of the other Comstock stocks we note sales of 300 shares of Belcher at \$1.35 @ \$1.95; 100 shares of Hale & Norcross at 75c.; 100 shares of Sierra Nevada at 95c.; 200 shares of Yellow Jacket at 75c.; 1,500 shares of Comstock Tunnel stock at 8c.; 100 shares of Mexi-can at \$1 and 100 shares of Union Consolidated at 70c.

Of the California stocks Bodie Consolidated shows a sale of 100 shares at 25c.

The superintendent of the Brunswick Consolidated Gold Mining Company writes as follows from Grass Valley under date of October 20th: We are getting to the crossing in the 700 drift, and stringers are forming which show gold nicely. There is about 12 in. of gauge with stringers running through it and I think we will soon have a good sized ledge.

Of the Colorado stocks Lacrosse continues to show the most activity; during the past week 3,400 shares of it are reported to have changed hands at 5 @ 8c. Leadville Consolidated shows sales of 800 shares at 12 @ 13c.

The Victor Gold Mining Company, of Cripple Creek, Colo., has declared dividend No. 9 of 7 1/2c. per share, or \$15,000, payable on November 15th. The books close on the 8th inst., and reopen on the 16th inst.

Ontario was the only Utah stock dealt in during the week; total shares of it amounted to 140 shares at \$8.

Phoenix of Arizona appeared in some demand at the close of the week. A total of 2,600 shares (reorganization certificates) changed hands at prices ranging from 47 to 59c.

NOTES OF THE WEEK.

According to the latest statements about Delaware, Lackawanna & Western stock, the combined Maxwell and Vanderbilt interests hold nearly one-third; the Taylor estate, the Astors, the Higgins estate and President Sloan about one-fourth; leaving about five-twelfths to small holders and floating stock.

The statement of the Philadelphia & Reading Coal and Iron Company for September shows that the gross receipts for the month were \$2,200,002; the expenses, including \$68,088 for colliery improvements, were \$2,093,703, leaving the net earnings \$106,299.

Boston.

Nov. 2

(From our Special Correspondent.)

Early in the week there was a good degree of activity in the market for copper shares and prices advanced quite sharply, but during the past few days

it has been extremely dull and lower prices have prevailed. The speculative element seems to be wanting and the investment demand is light, and the result is a dull and lifeless market.

Osceola advanced from \$27 to \$28 1/2, losing the fraction in the later dealings. Quincy sold in a small way at \$103 to \$105, about same as last week.

San Francisco, Nov. 3 (By Telegraph).—The opening quotations to-day are as follows: Best & Belcher, \$1.85; Bodie, 25c.; Belle Isle, 10c.; Bulwer, 10c.; Chollar, 45c.; Consolidated California & Virginia, \$3.25; Gould & Curry, 75c.; Hale & Norcross, 55c.; Mexican, 90c.; Mono, 10c.; North Belle Isle, 5c.; Navajo, 10c.; Ophir, \$1.60; Savage, 70c.; Sierra Nevada, 85c.; Union Consolidated, 85c.; Yellow Jacket, 65c.

San Francisco.

Nov. 3, 1893.

London. Oct. 24. (From our Special Correspondent.) The past week has been an exceedingly quiet one all round in the mining stock market.

on a satisfactory settlement of affairs. American stocks have been equally stagnant. De Lamars and Harquahalas have relapsed a trifle from want of support on the part of the general public; who seem at the present time to be quite indifferent.

The proposed reconstruction of Flagstaff, Utah, Limited, mentioned in last week's report, has been accepted by the shareholders of the company. At a meeting held October 19th a report was presented, giving the reasons for the reorganization.

The meeting of the Sierra Buttes Gold Mining Company was held October 19th to receive the report for the half year ending June 30th, 1893. After carrying £3,000 to the reserve fund, a balance remains of £3,977, out of which a dividend of 6d. per share is to be paid.

DIVIDENDS.

Mollie Gibson Consolidated Mining and Milling Company, dividend No. 40, of five cents per share, \$50,000, payable November 15th, at the office of the company in Colorado Springs, Colo.

MEETINGS.

Consolidated Quicksilver Mining Company, at the office of the company, No. 306 Pine street, room 6, San Francisco, Cal., November 7th, at 2 p. m.

Trinity Gold Mining Company, at the office of the company, No. 504 Kearny street, room 10, San Francisco, November 6th, at 4 p. m.

CURRENT PRICES.

Table listing various commodities and their prices, including items like Cadmium Iodide, China Clay, Chlorine Water, Chromic Acid, and various oils and minerals.

Table listing various commodities and their prices, including items like Mineral Wool, Phosphorus, Potassium Chloride, and various salts and acids.

Table listing various commodities and their prices, including items like Tin Crystals, Muriate, Vermillion, and various metals and alloys.

Table listing various commodities and their prices, including items like Tin Crystals, Muriate, Vermillion, and various metals and alloys.

NEW YORK MINING STOCK QUOTATIONS.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Table with columns for Name and Location of Company, Oct. 25, Oct. 26, Oct. 27, Nov. 1, Nov. 2, Nov. 3, SALES, and Name and Location of Company, Oct. 25, Oct. 26, Oct. 27, Nov. 1, Nov. 2, Nov. 3, SALES.

*Ex-dividend. †Sold in at New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 3,363. Non-dividend shares sold, 7,700. Total shares sold, 10,963.

BOSTON MINING STOCK QUOTATIONS.

Table with columns for Name of Company, Oct. 27, Oct. 28, Oct. 30, Oct. 31, Nov. 1, Nov. 2, SALES, and Name of Company, Oct. 27, Oct. 28, Oct. 30, Oct. 31, Nov. 1, Nov. 2, SALES.

Dividend shares sold, 7,002. Non-dividend shares sold, 3,759. Total shares sold, 10,761.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Table with columns for Name and Location of Company, Capital Stock, Shares (No., Par), Assessments (Total levied, Date and amount of last), Dividends (Total paid, Date and amount of last), Name and Location of Company, Capital Stock, Shares (No., Par), Assessments (Total levied, Date and amount of last), Dividends (Total paid, Date and amount of last).

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

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

G. Gold, S. Silver, L. Lead, C. Copper, B. Borax. * Non-assessable. † This company, as the Western, up to December 10th, 1881, paid \$1,400,000. ‡ Non-assessable for three years. § The Deadwood property paid \$775,000 in eleven dividends and the Terra \$75,000. Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends, and the Cons. Virginia \$42,360,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends. †† This company paid \$190,000 before the reorganization in 1880. ††† This company acquired the property of the Raymond & Fly Company which had paid \$3,075,000 in dividends. †††† Previous to this company's acquiring Northern Belle, that mine paid \$2,400,000 in dividends against \$425,000 in assessments.

COAL AND COAL RAILROAD STOCKS.

Table with columns for Stock Names, Oct. 28, Oct. 30, Oct. 31, Nov. 1, Nov. 2, Nov. 3, and Sales. Lists various coal and railroad stocks with their respective prices and sales figures.

* Ex-dividend. Total shares sold, 240,533.

INDUSTRIAL AND TRUST STOCKS.

Table with columns for Stock Names, Oct. 28, Oct. 30, Oct. 31, Nov. 1, Nov. 2, Nov. 3, and Sales. Lists industrial and trust stocks with their respective prices and sales figures.

Total sales, 467,528.

CALIFORNIA. San Francisco.

Table with columns for Stock Names, Oct. 27, Oct. 28, Oct. 30, Oct. 31, Nov. 1, Nov. 2. Lists California stocks from San Francisco with their respective prices.

COLORADO. Aspen.

Table with columns for Stock Names, Oct. 28, Price. Lists Colorado stocks from Aspen with their respective prices.

Colorado Springs. Oct. 28.

Table with columns for Stock Names, Bid, Asked. Lists Colorado Springs stocks with their respective bid and asked prices.

MARYLAND. Baltimore.

Table with columns for Stock Names, Bid, Asked. Lists Maryland stocks from Baltimore with their respective bid and asked prices.

MONTANA. Helena.

Table with columns for Stock Names, Bid, Asked. Lists Montana stocks from Helena with their respective bid and asked prices.

MINNESOTA.

Table with columns for Stock Names, Par, Bid, Asked. Lists Minnesota stocks from Duluth with their respective par, bid, and asked prices.

UNLISTED STOCKS.

Table with columns for Stock Names, Bid, Asked. Lists unlisted Minnesota stocks with their respective bid and asked prices.

Table with columns for Stock Names, Bid, Asked. Lists Missouri stocks from St. Louis with their respective bid and asked prices.

Table with columns for Stock Names, Bid, Asked. Lists Missouri stocks from Philadelphia with their respective bid and asked prices.

Table with columns for Stock Names, Bid, Asked. Lists Missouri stocks from Pittsburg with their respective bid and asked prices.

Table with columns for Stock Names, Bid, Asked. Lists Missouri stocks from London with their respective bid and asked prices.

Table with columns for Stock Names, Bid, Asked. Lists Missouri stocks from London with their respective bid and asked prices.

Table with columns for Stock Names, Buyer, Seller. Lists various international stocks with their respective buyer and seller information.

New York Mining Stocks.

Table with columns for Stock Names, Bid, Asked. Lists New York mining stocks with their respective bid and asked prices.

ASSESSMENTS.

Table with columns for COMPANY, No., Dlnqt. in office, Day of sale, Amt. per sh're. Lists various company assessments with their respective details.

CLASSIFIED LIST OF ADVERTISERS.

Adders and Calculators
Smith, R. C.

Air Compressors and Rock Drills
American Diamond Rock Boring Co.
Bullock, M. C., Mfg. Co.
Sarisleigh Rock Drill Co.
Clayton Air Compressor Works.
Gassensahl, W.
Ingersoll-Sergeant Rock Drill Co.
Morris County Machine & Iron Co.
Norwalk Iron Works Co.
Penn Diamond Drill & Mfg. Co.
Rand Drill Co. (See Diamond Drills.)

Aluminum
Cowles Electric, S. & A., Co.

Amalgamators
Bucyrus Steam Shovel & Dredge Co.
Denver Separator & Amalgamator.
Gates Iron Works.

Architects and Builders
Berlin Iron Bridge Co.
Pencoyd Bridge & Const. Co.
Pollock, Wm. B. & Co.
Scaife, Wm. B. & Son.

Arms and Ammunition
Hartley & Graham.

Assayers' and Chemists' Supplies
Ainsworth, Wm.
Baker & Adamson.
Baker & Co.
Berge, J. & H.
Bullock & Crenshaw.
Denver Fire Clay Co.
Henry Hill Chem. Co.
Hoskins, Wm.
Overbrook Chem. Co.
Penn Sm. & Ref. Wks.
Penna. Salt Mfg. Co.

Bankers and Brokers
Banteli, E. H.
Bieber & Sohne.
Billings, Robt. & Co.
Chilolm, A. R., & Co.
Cochran, A. M.
Gelder, Bailey & Co.
Grant, E. R.
Handy & Harman.
Hyde, Geo. A.
Mattes, E. C. & Co.

Belting
Groetzinger & Sons.
Hendrie & Bothorn Mfg. Co.
Jeffrey Mfg. Co.
New York Belting & Packing Co., Ltd.

Blasting Caps and Fuse
Lau, J. H., & Co.
Macbeth, James, & Co.
Metallic Cap Mfg. Co.

Blowers
Foss Mfg. Co.
Sturtevant, S. F. Co.

Boiler Compound
American Fluoride Co.

Boilers
Bullock & Wilcox Co. | Scaife, Wm. B. & Sons.
Reine Safety Boiler Co. | Star Boiler & Sheet
Orr & Sombower, Inc. | Iron Works.
Pollock, Wm. B. & Co. | Stirling Co. (See Machinery.)

Brake Shoes
Sargent Co.

Brick Machinery
Freese, E. M., & Co.

Bridges
Berlin Bridge Co. | Scaife, W. B., & Sons.
Pencoyd Br. Con. Co.

Buckets
Scaife, Wm. B. & Sons. (See Machinery.)

Calculators
Smith, R. C.

Carbons
Bishop, Victor, & Co.

Car Wheels
Whitney, A., & Co.

Chain and Link Belting (see Belting.)

Chemicals
Baker & Adamson.
Bullock & Crenshaw.
Henry Hill Chem. Co.
Overbrook Chem. Co.

Coal
Barwind-White Coal
Mfg. Co.
Cattner & Curran
Consolidation Coal Co.
Coxe Bros. & Co.
Haddock, Shonk & Co.
Coal Cutters
Ingersoll-Sergeant Drill Co.
Jeffrey Mfg. Co. (See Machinery.)

Concentrators, Crushers, Pulverizers, Separators, Etc.
Allis, Ed. P. & Co.
American Mining & Milling Machinery Co.
American Ore Machinery Co.
Beckett Foundry & Machine Co.
Blake, Theo. A.
Bradley Fertilizer Co.
Colorado Iron Works.
Copeland & Bacon.
Denver Separator & Amalgamator.
Fraser & Chalmers.
Fruie Vanner Concentrator.
Gates Iron Works.
Hendrie & Bothorn Mfg. Co.
Krom, S. B.
Mechanical Gold Extractor Co.
Pierce & Miller Engineering Co.
Seymour Concentrator Co.
Sturtevant Mill Co.
Walburn-Swenson Mfg. Co. (See Machinery.)

Copper Dealers and Producers
Abbott, Wheelock & Co.
American Metal Co.
Atlantic Mining Co.
Baibach S. & Ref. Co.
Baltimore Cop'r Wks.
Boston & Mont. Mfg. Co.
Canadian Copper Co.
Central Mining Co.
Copper Queen Mfg. Co.

Contractors and Miners' Supplies
Bucyrus Steam Shovel and Dredge Co.
Pollock, Wm. B. & Co.
Pratt & Whitney Co. (See Machinery.)

Corrugated Iron
Berlin Iron Bridge Co. | Scaife, W. B. & Sons.

Dermagutline
Groetzinger & Sons

Desks, Chairs, Etc.
Andrews, A. H. & Co.

Diamonds
Bishop, Victor & Co.

Diamond Drills
American Diamond Rock Boring Co.
Bishop, Victor, & Co.
Bullock Mfg. Co., M. C.
Gassensahl, W.
Ingersoll-Sergeant Drill & Mfg. Co.
Sullivan Machinery Co. (See Air Compressors and Rock Drills.)

Drawing Materials | Heller, Chas. S.
Alteneder, Theo. & Son.

Dredges
Bucyrus Steam Shovel & Dredge Co.
Southern & Co.

Dump Cars
Hunt Co., C. W.
Thacher Car & Con. Co.

Educational Institutions
Concoran Scientific School.
Harvard Univ. (Lawrence Scientific School)
Michigan Mining School.
Pennsylvania Military College.
Woodside Seminary.

Electrical Machinery and Supplies
General Electric Co.
Jeffrey Mfg. Co.
Okonite Co., Limited.
Thomson-Houston International Co.

Elevators, Conveyors and Hoisting Machines
Brown Hoisting and Convey. Mach. Co.
California Wire Works.
Cooper, Hewitt & Co.
Davis, F. M., Iron Works.
Hunt, C. W., Co.
Jeffrey Manufacturing Co.
Orr & Sombower, Inc.
Scaife, Wm. B. & Sons.
Union Wire Rope Tramway Co.
Vulcan Iron Wks. (See Wire Rope Tramway and Machinery.)

Emery Wheels
New York Belting & Packing Co., Ltd.

Emery Mill Stones
Sturtevant Mill Co.

Employment Bureaus
Engineering Employment Bureau.

Engineers, Chemists, Metallurgists
Young & Park.
Adams, J. N.
Adams, W. H.
Argall, Philip.
Askew & Russell.
Baker & Co.
Blandy, John F.
Blarney, Harrington.
Boggs, W. R., Jr.
Boss, Clarence M.
Boss, M. P.
Brodie, Walter H.
Burdick, J. H.
Burlingame, E. E.
Butters, Charles.
Cambell-Finston R.C.
Case, Wm. E.
Cary, J. Stockly.
Cazin, Franz.
Chandler, W. H.
Channing, J. Parke.
Chanute, D.
Charard, Thomas M.
Clark, C. H.
Clark, Ellis.
Clement, Victor M.
Collins, J. H. & Sons.
Cramer, Stuart W.
Darling, L. B.
De la Bouglisse, Geo.
Dewey, Frederic P.
Dickerman, Alton L.
Dickinson, H. P.
Donald, J. T.
Drysdale, Dr. W. A.
Emmens, Stephen H.
Everette, Dr. W. E.
Farish, John B.
Farish, Wm. A.
Fearn, Percy L.
Fisk, W. W.
Freeland, Francis T.
Froehling, Dr. Henry.
Furlong, W. H.
Genth, F. A., Jr.
Gouldie, James H.
Hahn, O. H.
Hall Bros.
Hammond, John Hays
Hampton, W. Hundley
Hardman, John E.
Hastings, John B.
Hedburg, E.
Herdon, J. H.
Hofman, Ottokar.
Hollbaugh, J. R.
Hooker & Lawrence.
Hunt & Robertson.
Inne, F. W.
Jennings, E. P.

Engineers' Instruments
Alteneder, T. & Son.
Brandt, Sons.
Bullock & Crenshaw.
Everhardt, J. M.
Gurley, W. & L. E.
Heller, Chas. S.
Queen & Co.
Orr & Sombower, Inc.
Union Iron Works. (See Machinery.)

Excavators
Bucyrus Steam Shovel & Dredge Co.
Southern & Co.

Fire-Brick and Clay
Chur, A. T.
Denver First-Clay Co.

Forges
Foss Mfg. Co.

Furnaces
Hoskins, Wm. | Moore, S. L., & Son Co.
 | Sturtevant, W. B. & Co. (See Machinery.)

Furniture Office, Etc.
Andrews, A. H. & Co.

Gas Works
Pollock, Wm. B. & Co. | Wood, R. D. & Co.

Gauges, Recording, Etc.
Bristol Mfg. Co. | Lyverhardt, J. M.

Grease, Grappits, Etc.
Dixon, Jos. Crucible Co.

Hose, Rubber
New York Belting & Packing Co., Ltd.

Hotels
The Cochran.
Owen House.

Inspection and Tests
Hunt, The Robert, W. Co.

Insulated Wires and Cables
Okonite Co., Ltd.

Insurance Companies
Hartford Steam Boiler Inspect'n and Ins. Co.
Mutual Life Insurance Co.

Lamps, Miners'
Everhardt, J. M.

Locomotives
Penn Diamond Drill & Mfg. Co. | Porter, H. K., & Co.
Thomson-Houston International Co.

Lubricants
Dixon, Jos. Crucible Co.

Manganese Steel
Taylor Iron & Steel Co.

Mats, Rubber
New York Belting and Packing Co., Ltd.

Machinery, Milling, and Other Machinery
Allentown Foundry & Machine Co.
Allis, Edw. P., & Co.
American Mining & Milling Machinery Co.
American Ore Machinery Co.
Beckett Foundry & Machine Co.
Buckeye Engine Co.
Bullock, M. C., Mfg. Co.
Carbon Steel Co.
Colorado Iron Works.
Copeland & Bacon.
Davis, F. M., Iron Works Co.
Fraser & Chalmers.
Griffith & Wedge Co.
Hendrie & Bothorn Mfg. Co.
Jeffrey Mfg. Co.
Mechanical Gold Extractor Co.
Mecklenburg Iron Works.
Moore, Samuel L., & Son.
Morris County Mach. & I. Co.
Oil Well Supply Co.
Orr & Sombower, Incorp.
Penn Diamond Drill & Mfg. Co.
Pierce & Miller Engineering Co.
Pollock, Wm. B., & Co.
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Detroit Copper Mfg. Co.
Eureka Co.
Wickel
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Snelson, W. H., Assaying & Engineering Co.

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El Minerero Mexicano. | Iron & Coal Trades
Electrical Plant & Review.
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Inquiries from employers in want of Superintendents, Engineers, Metallurgists, Chemists, Mine or Furnace Foreman, or other assistance of this character, will be inserted in this column WITHOUT CHARGE, whether subscribers or not.

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1264 A PRACTICAL MAN WHO CAN control some trade in foundry and machine business to take an interest in an established business in Brooklyn, N. Y., which is well equipped to manufacture any line of iron or wood working specialties. Address, PROGRESS, ENGINEERING AND MINING JOURNAL.

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1278 WANTED—PERSON THAT THOR- oughly understands hydraulic work. Need not be a mining engineer, but rather a man to take second place to take charge of active work. Address NORTH CAROLINA, ENGINEERING AND MINING JOURNAL.

1279 WANTED—A GOOD YOUNG MAN AS gold and silver assayer. Address ASSAY, MINING AND ENGINEERING JOURNAL.

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WANTED—A POSITION AS ASSISTANT Superintendent at copper mines and works; is a competent assayer; 4 years' experience in smelting; has ability in handling men. Best of reference; salary not so much an object. Address MATTE, ENGINEERING AND MINING JOURNAL. No. 15,496, Nov. 11.

AN AMERICAN, WITH FIVE YEARS' EX- perience in Mexico as accountant and interpreter for mining company, desires similar position; fully posted on Mexican mining and commercial laws; best of references and bond if necessary. Address G. T. W., 40 Weirfield Street, Brooklyn, N. Y. No. 15,513, Nov. 11.

GRADUATE CHEMIST AND ENGINEER late superintendent of a large plant, is open to engagement; references. Address SMITH, Pilot, Va. No. 15,519, Nov. 11.

GRADUATED CHEMIST, WITH PRAC- tical experience, wants position. Specialties: Iron and steel and assaying. Address M. S. R., ENGINEERING AND MINING JOURNAL. No. 15,591, Nov. 18.

MECHANICAL DRAUGHTSMAN WISHES position. Six years' experience in machine shop and draughting room. Familiar with pump work and plans for electric plants. Good references. Address DRAUGHTSMAN, ENGINEERING AND MINING JOURNAL. No. 15,592, Nov. 18.

GRADUATE, EXPERIENCED IN MINING, milling, leaching and smelting gold and copper ores, would like position in office or laboratory, preferably with some company developing new property. Address MONTANA, ENGINEERING AND MINING JOURNAL. No. 15,504, Nov. 18.

AN EXPERIENCED ENGINEER WANTS employment. Will go anywhere. Specialties: Hydraulic and quartz mining, smelting and construction. References. Address CALIFORNIA, ENGINEERING AND MINING JOURNAL. No. 15,466, Nov. 18.

A HYDRAULIC MINER, AGED 36, BORN and raised in the mines of California, with a number of years practical experience with high-banks, bank-blasting, sluice tunnel running, ditch-work, etc., etc., wants position. Best Reference. Address P. O. Box No. 183, Nevada City, Cal. No. 15,515, Nov. 25.

CHEMIST—YOUNG ANALYTICAL CHEM- ist who is not afraid of any amount of hard work wants place as chemist or assistant. Have had some technical experience and the best of professional training. References furnished. Address "X," ENGINEERING AND MINING JOURNAL. No. 15,516, Nov. 25.

WANTED—POSITION BY YOUNG MAN thoroughly familiar with the manufacture of platinum fuses. Has had five years' practical experience as superintendent in fuse factory. Address W. S. WILLMARTH, Amityville, Long Island, N. Y. No. 15,590, Dec. 2.

RESPONSIBLE POSITION WANTED BY A graduated chemist and engineer; superintendency or assistant superintendency in steel works or blast furnaces preferred; is a metallurgist and can burden furnace; is well up in modern engineering practice; thoroughly understands machinery and the economies of production; can design and build mills or furnace plants. Address "MODERN ENGINEERING," ENGINEERING AND MINING JOURNAL. 11

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PUMPING ENGINES.—Sealed proposals for furnishing two sewage engines will be received by the Sewerage Commissioners of the City of Brockton, Mass., until December 1st, 1893, at their office, Room 27, Home Bank Block, Brockton, Mass. The work consists of furnishing, setting up and completing, ready for use, two pumping engines and two boilers, piping and all necessary appliances and fittings such as are to be found in pumping stations of the first class. Each engine must be capable of easily raising 5,000,000 gallons of sewage per day 48 ft. through 16,650 ft. of 24-in. cast-iron pipe. Each boiler must be capable of supplying steam for one of the engines when discharging 5,000,000 gallons per day. Each proposal must be made on the blank forms furnished by the Commissioners, and must be accompanied by a certified check for the amount of \$500. Forms of contract and specifications can be obtained and plans seen at the above office. The right to reject any and all bids is expressly reserved. R. P. KINGMAN, A. C. THOMPSON, H. A. MONK, Sewerage Commissioners. F. HERBERT SNOW, City Engineer.

NAVAL SUPPLIES.—Sealed proposals, endorsed "Proposals for Supplies for the New York Navy Yard to be Opened Nov. 14, 1893," will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until November 14th, 1893, and publicly opened immediately thereafter, to furnish at the New York Navy Yard a quantity of carnet boiler tubes, iron, steel, drills, tools, diving apparatus, files, blocks, shears, packing, paints, alcohol, valves, pine, blacking, rrooms, forks, iron and steel plates, magnesia, asbestos, rivets, fur aces, brass tubes, copper and grommets. The articles must conform to the navy standard and pass the usual naval inspection. Blank proposals will be furnished upon application to the Navy Pay Office, New York. The Department reserves the right to reject any or all bids not deemed advantageous to the Government. EDWIN STEWART, Paymaster General, U. S. Navy.

BRIDGE.—BUDAPEST, AUSTRO-HUN- gary.—A bridge of a total length of 312 meters and another of 332 meters will be executed on the Danube at Budapest. An international competition for plans and projects is opened for these two bridges. Without regarding to which bridge it refers a prize of \$6,000 will be awarded to the best project, and a prize of \$4,050 to the second best project. If the best project solved the question of connecting the two banks at the Eskuter with one opening, so that it answers the stipulations contained in the conditions, this project will receive a special premium of \$2,030, besides the allotted first prize. The Hungarian minister of commerce reserves the right of buying any of the not rewarded projects for \$1,015. If one of the winners should be commissioned to execute the work upon the basis of his tender the prize allotted will not be paid. The projects provided with device and sealed letter containing the device are to be presented to the manager of the bureaux of the Hungarian royal ministry of commerce (Budapest, Lenczvid, ulca) latest the 31 January, 1894, toward receipt. The terms to which the surroundings of the bridges and the plans and longitudinal section of every bridge are subjoined can be obtained at every consulate-general of Austria-Hungary.

PUMPING ENGINES, ETC.—NEW YORK City.—Department of public works, 31 Chambers street, opens bids November 13th for furnishing materials, building and erecting pumping engines, boilers and appurtenances for the high service works at the new aqueduct between Tenth avenue and Harlem river.

PUMPING ENGINES.—ST. LOUIS, MO.—THE board of public improvements will receive bids until November 14th for two 30,000,000 gallon pumping engines at the Chain of Rocks station.

CAST IRON WATER PIPE.—Sealed proposals for cast iron water pipe will be received by the Committee on an Additional Water Supply of the city of Waterbury until the 10th day of November, 1893, at which hour the bids will be publicly opened and read. Bids must be made on blank furnished by the Committee, and no bids will be considered unless all blanks are properly filled out. An approximate estimate of the amount of pipe to be furnished is as follows: Weighing lengths (to lay 12 ft.) of 36-in. pipe, 2,500, 5,300 lbs. per length; 200 tons of special castings. Blank forms and all necessary information can be obtained at the office of the City Engineer, No. 25 Bohl's Building, Waterbury, Conn. By order of the Committee on an Additional Water Supply, R. A. CAIRNS, C. E., City Engineer.

GRADUATION.—Sonora & Sinaloa Irrigation Company, 58 William street, New York.—Proposals will be received at this office until December 20th, 1893, for the graduation of 20 miles, more or less, of the Yaqui Canal, on the south side of the Yaqui River, in Sonora, Mexico. Form of contract and specifications and full information concerning the nature of the work can be obtained at this office. Due notice will be given to bidders of time and place of opening proposals and awarding contract. E. S. NETTLETON, Chief Engineer.

LEVEE WORK.—U. S. ENGINEER OFFICE, 106 Mad- ison street, Memphis, Tenn.—Sealed proposals in triplicate will be received at this office until December 5th, 1893, for the enlargement and construction of levees in the lower Yazoo district, containing about 335,000 cubic yards; the work to be completed by June 30th, 1895. Specifications, blank forms and all available information will be furnished on application to this office. C. MCD. TOWNSEND, Captain of Engineers U. S. Army.

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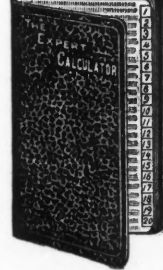
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PERCY HAGERMAN, Sec'y-Treas.

MACHINERY AND SUPPLIES FOR SALE.

NOTICE.

This column is particularly devoted to machinery and goods for sale. If you have anything in this line to dispose of, it will pay you to insert a card here. For advertising rates write to the
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