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* Illustrated.

Table listing regional news and market information under headings like MINING NEWS, FOREIGN, COAL, IRON, PHILADELPHIA, SAN FRANCISCO, CURRENT PRICES, ADVT. INDEX, and ADVT. RATES.

THE demand for Dr. PETER'S "Modern American Methods of Copper Smelting" has made it necessary to issue a sixth edition. The value of this work has been fully proved by this continued demand for it, which has already exhausted five editions.

It should be noted that the period during which mining machinery can be imported into Canada free of duty has been extended until May, 1896. The exemption applies to all machinery of kinds or classes not manufactured in the Dominion. As very little special mining machinery is so manufactured, the field is open practically for all makers.

THE prices of iron and steel in Germany continue to decline, and the works generally show a scarcity of orders. At the great KRUPP works at Essen it is stated that business has never been so slack as at present, and a considerable part of the plant is idle. The Belgian works are doing somewhat better, but still do not report a favorable condition of business.

It is announced that an international exposition is to be held at Hobart in Tasmania, beginning in November, 1894, to remain open for six months. While all nations are invited, the exposition will, of course, be chiefly for the benefit of the Australasian colonies. Our mining and other machinery is already favorably known in that part of the world, and this Tasmanian Exposition will give manufacturers an opportunity to extend the knowledge and use of their products there.

THE positive statement made in several of the daily and some of the trade papers that the new rail combination has arranged with the Maryland and Pennsylvania steel companies for the lease of their works or that they shall not make rails is certainly unfounded. The Maryland and Pennsylvania works have not been leased, and we do not believe that they will be leased. While the price of rails is very low, no doubt they will not make them, but if the price goes to \$26 or \$27 they will undoubtedly commence their manufacture.

THE gold output of the Witwatersrand mines continues to increase steadily, and in October was larger than in any month yet reported, reaching a total of 138,599 oz. (we again express regret that "fine ounces" are not used in these figures). The production for the 10 months ending with October was very nearly equal to that for the entire year of 1892. Operations are being extended and new mills put up, so that a further increase is expected.

THE troubles in Matabeleland are now in a fair way to be settled, and next year the gold production of South Africa will be increased by that of the new fields, but to how great an extent is yet uncertain.

THE question of mining wages in Montana, to which reference was made in the ENGINEERING AND MINING JOURNAL of November 18th, is briefly discussed from the superintendent's standpoint in another column, by a correspondent who professes his willingness to give up 50 per cent. of his pay as manager, providing the miners will consent to a reduction of 25 per cent. in theirs. This, he intimates, they have not shown themselves willing to consent to. Such a retort is a perfectly fair one when made in good faith, as this is. A reduction in income is not an agreeable thing for any of us to face, but unfortunately it is sometimes necessary, as in the Montana case. It will be a little easier if all share in it alike and recognize that circumstances make it unavoidable.

THE commissioner sent by the Chilean Government to the Columbian Fair also represents temporarily in this country the interests of the Mining and Metallurgical Exposition to be held in Santiago in September of next year, Senor FRANCISCO J. SAN ROMAN, is now in New York and expects to remain in that city for several weeks. His address is at the Sturtevant House, and he is very desirous of getting into communication with manufacturers who wish to be represented at the Chilean Exposition. There is no doubt that our manufacturers will find it to their interest to avail themselves of this opportunity to widen their markets. The use of modern and improved mining machinery is extending both in Chile and the neighboring States; and our makers ought to supply this demand still more fully than they now do. The commissioner will be much pleased to give information to any one who desires it, and it is to be hoped that many of our manufacturers will communicate with him.

THE present indications are that the Lehigh Valley Railroad strike will not succeed, and the probability is that many of the men will return to work on the company's offer, practically leaving the questions at issue unsettled. Without going into the original grievances, it may be said that the men showed lack of judgment in forcing a fight at the present time, when the advantages were nearly all on the side of the company; and the large number of men out of work and needing it badly made it unusually easy to fill the strikers' places, while at the same time it was difficult to secure the support of the men on other roads who recognize these facts.

It may be said, also, that the managers of the company were in the wrong in refusing in the first place to treat with committees or delegates representing the men and asserting that it would deal with its employees

only as individuals. Organization is necessary for men who have to deal with a powerful corporation, and union for their own protection is a perfectly legitimate course to follow. To refuse to recognize such a union is not only wrong in itself, but it is also bad policy, as has been shown in more than one instance. Even should the strike fail and the men return to work in the present case, there will remain a bitter feeling which will not benefit the road. A proper and reasonable presentation of grievances is the right of employees, and a curt refusal to hear a committee is a blunder, which many railroad men are too much inclined to make—and which some of them have regretted afterward.

THE English trade papers call attention to the fact that German iron and steel prices are already below their own, and that the prices ruling in the United States are, as we have already noted, approaching very nearly the English level. While this condition is partly due to the unfavorable condition of trade, it is also due partly to improvements in manufacture and economies in production, and so may be expected to continue. Germany has already made inroads upon the foreign iron and steel trade of Great Britain, and the manufacturers there now begin to fear competition from this country also. The greater comparative productiveness of our works has been admitted, but the English ironmasters have generally claimed that this was gained at the expense of economy in fuel. They are willing to admit some of the advantages of this country, however, and, if iron and steel can be made without loss at the prices now ruling, consider that competition from this side of the water is much more threatening for the future than that of Germany and Belgium, since the resources of those countries are comparatively limited and will not permit the great expansion in production which is possible here. In fact Germany imports more than she exports, and any large demand from the outside on any of the European iron producing countries could only be filled at a considerable advance in prices over those of the most economical works which are now supplying the home markets. In England itself more dependence must be placed upon foreign iron ores every year, and the prospects for any considerable decrease in cost of production are not favorable.

THE curious metal, sodium, which never occurs in nature and is seldom seen even in the laboratory, though its salts, especially the chloride, are distributed in vast quantities in every part of the world, has experienced many vicissitudes since it first became a metal of industrial importance. Only a few years ago metallic sodium was necessary for the production of aluminum, and when it seemed that the use of the latter metal in the arts was likely to increase, the Aluminum Company, Limited, whose works are at Oldbury, near Birmingham, England, engaged in the manufacture of sodium and aluminum on a rather large scale, employing the process of Mr. H. Y. CASTNER, an American chemist. The electrolytic processes for the production of aluminum came into use however, immediately afterward, and, the sodium process being unable to compete with them, the Aluminum Company was compelled to withdraw from the business. The prospects for the metal sodium at that time were not bright. It was easy to make it by the CASTNER process, but the question to be solved was what could be done with it. In due course of time, however, this was worked out by Mr. CASTNER and the chemists of the Aluminum Company in an entirely original manner. Sodium is now employed for the preparation of sodium peroxide (Na_2O_2), which is a highly effective and economical agent for bleaching and other industrial purposes on account of its powerful oxidizing properties, taking the place of hydrogen peroxide, which is an unstable compound and, moreover, is far less efficient. The peroxide of sodium is a powder, which is easily kept in tin cans. It is used with a weak solution of sulphuric or chlorhydric acid, which sets free one atom of its oxygen. The consumption of the substance is increasing rapidly.

THE PROPOSED TARIFF CHANGES.

We devote much space this week to the tariff bill; and as a proper introduction to it we quote the statement made by Mr. WILSON, whose name it bears and who is chairman of the Committee of Ways and Means. This statement gives clearly the lines on which the bill has been drawn and the objects it is intended to attain; these are almost identical with the recommendations of President Arthur and the Republican party in 1882 and 1883, when the Republicans urged the reduction of the duties, then very much lower than they are now, and the free admission of raw materials. It is needless to tell readers of the ENGINEERING AND MINING JOURNAL that it has always favored this policy in the interests of the extension of American manufacturing industry and trade and the consequent improvement in the condition of labor which necessarily follows an increasing demand for it. This journal takes no sides in party politics; but in economic questions affecting the industry it gives such information, without reference to its party political bearing, as may impart a better understanding of the subject. To us the proposed tariff bill seems a measure of moderate protection which will in most cases fully protect our industries. It is inevitable that any change in the tariff, whether up

or down, will prove injurious to some industries, and some of the changes proposed in the WILSON bill will inconvenience and cause losses in certain directions. In such cases, the benefits in one direction have to be credited against the injuries caused in another, in judging of the net result.

The placing on the free list of such articles as we now produce in such quantities as to fully supply our own markets and also a large part of the foreign markets, as is the case with our copper and many other things, will have no influence whatever. Articles like coal and iron ore can not be much injured by the proposed changes, for we produce as cheaply and generally at a less cost here than in foreign countries, and in most cases the inland freights add a substantial protection to our producers. What they lose in supplying distant points which are more accessible to foreign producers will be abundantly made up by the wider foreign markets it will enable them to secure.

This country must and inevitably will become the workshop for a large part of the world's consumers, and it is high time we appreciated this and took steps that will enable us to profit more fully by our own unequalled natural resources and the unequalled ingenuity, intelligence and industry of our people. It is probable that many changes will be made in the bill as it goes through Congress, but the general plan of reducing the tariff to a moderate degree and of admitting raw materials free will, we believe, commend itself to our people as a whole, without regard to party politics.

THE DAUPHIN ISLAND, ALABAMA, SCHEME.

A correspondent of the Baltimore "Manufacturers' Record," signing himself "An Engineer," takes up the cause of the Dauphin Island scheme and says our remarks were "ill conceived," and our statements "utterly false and ridiculously incorrect." This is what we said:

1. That the Dauphin Island Railway and Harbor Company owns about 680 acres on the western end of the island, and not nearly four times that amount as claimed by the company's statements.
2. That that portion of the island—a mere sand bar—was inundated in a recent storm.
3. That the trestle from the main land to this property would be 10.7 miles, a portion of which will be in quicksands.
4. That the harbor is to be built out into the open Gulf of Mexico.
5. That the scheme from an engineering standpoint is wild.
6. That those who propose investing in it should have the whole enterprise carefully investigated by competent and disinterested experts before they part with their money.

Our critic substantially confirms the accuracy of these statements.

He says: 1st "The company owns about 700 acres."

After explaining that the eastern end of the island (which does not belong to the Dauphin Island Railway and Harbor Company, and concerning which we made no statement) is, in places, comparatively high ground, beyond the reach of the waves, he adds: 2d. The western extremity of the island "was, of course, washed by the waves," thus fully confirming our statement.

3d and 4th. He says: "The distance from Cedar Point to the northwest end of Little Dauphin Island is some five miles," which may be so, but as this is not the location of the trestle and would not bring the road to the proposed harbor on the company's land the fact is irrelevant. The engineer's map, which is before us, gives the trestle distance on the proposed line of road as 10.7 miles, while pilots and sailors familiar with the ground have informed us that a portion of this distance is in quicksand. "An Engineer" doubts this but does not deny it, though he reluctantly admits that "some difficulty may be found in securing proper foundations for breakwaters." The experience of engineers and the results of the recent and other storms on the Gulf have abundantly demonstrated that there is not only "some difficulty in securing foundations," but that there is extreme difficulty in maintaining such works on the treacherous sands of the exposed Gulf coast. The experience of the Mississippi and Galveston jetties and numerous lesser works, many of which have entirely disappeared, is accessible and of record in the transactions of our engineering societies.

We have not said that it is impossible to build such works—with unlimited capital nearly anything is possible—but assuredly all experience fully justifies us in characterizing as "wild engineering" a scheme to trestle and bridge 10.7 miles, including a navigable channel, to get to a sandbar which has been inundated, or, as "An Engineer" says, "of course was washed by the waves" in the recent storm, and then to construct out in the open Gulf an unprotected harbor which can be made equally well at almost any point along the whole Gulf coast. There are still other features to which it is not now necessary to refer, which render this undertaking are not only "wild in the extreme" but absolutely ridiculous.

Moreover, if the sandbars of the open Gulf coast present difficult foundations for the proposed works, there is not lacking evidence that the London foundations of the enterprise are scarcely less treacherous. There is full justification for the words of warning we have spoken, and in the interest of Alabama, as well as of the English investors, we trust careful investigation will be made before these latter part with their money.

NEW PUBLICATIONS.

THE ENGINEERING SOCIETY ANNUAL; VOL. I. Athens, Georgia; published by the Engineering Society of the University of Georgia; O. H. Sheffield, editor and manager; E. B. Eppes and R. J. Gantt, assistants. Pages 88; illustrated.

This volume contains a number of papers presented at meetings of the Engineering Society of the University of Georgia during the session of 1892-93, some of them written by students, and others by graduates of the institution. Among the subjects treated are Hydraulic Excavation; Georgia Marbles; Artesian Wells; Bridge-pier Foundations; The Forestry Question; Road Improvements and Track Maintenance. Most of the papers are brief and to the point, and the impression conveyed is that the Society is very much in earnest in its work, and deserves success.

MAP OF MASHONALAND AND MATABELELAND. Compiled by E. P. Mathers, F. G. S., editor of "South Africa," London, England; published by the Compiler.

This map has been prepared from the latest surveys, and is of especial interest at the present time, when so much attention has been drawn to the region shown, by the present position of the Chartered Company, of South Africa, and the war in which it was involved the English Government. The most striking fact brought to one's attention by this map is the manner in which British claims have been extended into Central Africa in such a way as to completely surround the independent states of the Transvaal and the Orange Free State, and cut off their development to the northward. Mashonaland and the adjoining territories are the best portion of South Africa, and they are now completely under British influence, as the present war is not likely to have any other issue than a complete subjugation of the native tribes, and their submission to a British protectorate. The map is accompanied by a few pages of text, giving an account of the regions shown and of their native inhabitants.

THE WORLD'S CONGRESS OF BANKERS AND FINANCIERS. ADDRESSES AND PAPERS. Chicago; Rand, McNall, & Co. Pages 116.

One of the most important congresses held in Chicago during the continuance of the Exposition was that of the Bankers and Financiers. Like all the others this congress was held under the auspices of the World's Congress Auxiliary to the Columbian Exposition, and constituted the department of commerce and finance. As many of our readers no doubt remember, this congress was largely attended, and many eminent men presented papers or made addresses. Reports were presented on banking in the various States of the United States and in other countries, and the financial situation, both of the United States and the world generally, was discussed from almost every possible point of view. The papers and the discussions included such subjects as the World's Experience in Banking; The Gold Standard; Free Coinage of Silver; The Monetary Conference of 1892; Universal Bimetallism, and an International Monetary Clearing House; Sound Systems of Banking and Currency; Clearing House; Municipal and Industrial Credits, and others, the list given by no means exhausting the variety of topics. The addresses made and the papers read have now been published in a handsome volume of over 600 pages, arranged and prepared by Mr. Lyman J. Gage, who was chairman of the Committee of Arrangements, and who explains the object and organization of the congress in a brief preface.

The volume before us should be of interest to every thinking man; it presents the thoughts and opinions of many trained financiers upon subjects of vital importance to the country. Different phases of opinion are presented by able advocates, and there are very few men who cannot learn something from reading these papers. The publishers have presented them in very handsome style.

IOWA GEOLOGICAL SURVEY. VOL. I. FIRST ANNUAL REPORT FOR 1892. Dr. Samuel Calvin, State Geologist; Dr. Charles R. Keyes, assistant. Des Moines, Ia.; published for the Survey. Pages 472; illustrated.

The Iowa geological survey is comparatively new, having been first established by an act of the legislature of 1892, and the work was not fairly begun until after the Geological Board had completed its appointments, and approved the plans of the State Geologist at a meeting held in July of that year. The field-work was begun at once, but nearly two months passed before suitable offices and equipment could be provided. Owing to the lateness of the season when work was begun, it was considered best to devote most of the time to preliminary reconnaissance, but at the same time much valuable information was collected in preparation for the future work of the survey, which, of course, includes primarily the collection of information and the determination of the location and extent of the geological deposits of economic value. The best attainable division of the work was made. The State Geologist, in addition to the general supervision and organization of the work, attended to the survey of the central part of the State, Dr. Keyes devoting himself to the coal fields, while other special fields were given to the assistants, and Prof. C. D. Jameson conducted a series of tests of clays and of cement material. In spite of the short time the work was fairly begun and preparations made for continuing it on a comprehensive scale.

In its first report the Survey has given us a handsome volume containing the reports of the geologists and his assistants, and several valuable papers, including one on the Geological Formations of Iowa, by Dr. Keyes; on the Cretaceous Deposits and their Economic Uses, by Dr. Calvin; Ancient Lava Flows in the Strata of Iowa, by S. W. Beyer; the St. Louis Limestone, by H. F. Bain; Dolomitic Building Stones, by G. L. Houser; and a carefully prepared and valuable bibliography of Iowa Geology, by Dr. Keyes. Of some of these papers, especially that on the coal measures of the State, we hope to present hereafter a summary to our readers.

The report is illustrated by several maps and a number of diagrams and half-tone plates taken from photographs, showing geological strata. The first report is very creditable to the Survey, and it is to be hoped that the work will be continued on the same scale and on the same excellent plans which have marked its beginning.

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.

Useful Information for Practical Men. Compiled by Wm. D. Ramsay, Engineer. Wilmington, Del.; the Repauno Chemical Co. Pages, 164; illustrated. Price, \$1.

Ohio Society of Civil Engineers and Surveyors. Fourteenth Annual Report. Alliance, O.; published for the Society, Charles A. Judson, Secretary. Pages, 236; with diagrams.

Modern American Methods of Copper Smelting. By Edward Dyer Peters, Jr., M. D. Sixth edition, revised and enlarged. New York; The Scientific Publishing Co. Pages 400; illustrated. Price \$4.

United States Geological Survey. Bulletin No. 108. A Geological Reconnaissance in Central Washington. By Israel Cook Russell. Washington; Government Printing Office. Pamphlet, pages 108; illustrated. Price, 15c.

California State Mining Bureau. Eleventh Report of the State Mineralogist. Wm. Ireland, Jr., and J. J. Crawford, State Mineralogists. Sacramento, Cal.; State Printing Office. Pages, 612; illustrated, and with maps.

Text Book of Petrology: A Description of Rock-Forming Minerals and a Synopsis of the Chief Types of Igneous Rocks. By Frederick H. Hatch, F. G. S. London; Swan, Sonnenschein & Co., and New York; Macmillan & Co. Pages, 222; illustrated. Price, 90c.

The Mechanics of Hoisting Machinery; Including Accumulators, Excavators and Pile Drivers. By Dr. Julius Weisbach and Prof. Gustav Herrmann. Translated from the German by Karl P. Dahlstrom. London and New York; Macmillan & Co. Pages 332; illustrated. Price, \$3.75.

CORRESPONDENCE.

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

All letters should be addressed to the MANAGING EDITOR.

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

The Granulating Matte Process.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Referring to the letter on granulation of matte in your issue of October 28th, Mr. James McArthur is correct in giving the credit to the Orford Company, but I am not aware of any matte having been granulated by pressure at our Constable Hook Works; but the granulation of slag and metallic copper has been carried on more or less during the last 10 years. The facts are, that in the spring of 1881 Mr. W. E. C. Eustis, of Boston, then president of the Orford Company, made the suggestion and erected the plant for the granulation of matte and the slags, at the works of the Orford Company, at Capelton, Quebec, Canada. The operation was a thorough success; several thousand tons of granulated matte were shipped to the Constable Hook Works.

CONSTABLE HOOK, N. J., Nov. 23, 1893.

JOHN L. THOMSON.

Reductions in Mining Wages.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Your worthy correspondent, "M.," from Butte, Mont., in your issue of November 18th, 1893, may now show up his sincerity in the offer he makes. As a "Superintendent and Manager" I will reduce my salary 50% (one half) if the 100 miners now working for me at \$3.50 a day (union wages) will reduce their wages 25% (one fourth). I can assure "M.," that I put in more solid hours of work and anxiety than any miner working for me, and I do more than simply ask "whether everything was 'O. K.'" I have not consulted with a single "superintendent and manager" in Montana, but will agree with "M.," to get every one to join me in my "own medicine" if "M.," will agree to take one-half of the same "medicine" and "have the intelligent part" and "the miners union" agree cheerfully and peaceably to my proposition "during the present business depression."

Now, Friend "M.," what we want is "action," not "talk"—action, not sentiment; prosperity and plenty of work, not the old chestnut, "poor workingmen." I am ready to enter into this agreement on demand. I want no "red tape." What is your answer, Friend "M.?"

MONTANA, Nov. 23, 1893.

SERVABO FIDEM.

THE COMPOSITION OF NICKELIFEROUS PYRRHOTITE.

Written for the Engineering and Mining Journal by David H. Browne.

An article by Dr. Emmens in the August issue of the "Canadian Mining and Mechanical Review" under this caption contains some peculiarly iconoclastic statements in regard to our accepted ideas of this interesting mineral. The article is too long to quote by abstract, but from the analysis and magnetic behavior of two impure samples of Sudbury and Gap mine ore Dr. Emmens deduces the following conclusions, five of which are given categorically at the end of his article, while others are earlier brought to light:

1. "The constitution of nickeliferous pyrrhotite is not represented by the time-honored and somewhat superficial generalization" that nickel is a constituent replacing part of the iron in the pyrrhotite.
2. Nickel exists in the Sudbury ore in part in the form of a mineral having the analysis Ni 23.16, Fe 33.92, S 42.92.
3. The composition of nickeliferous pyrrhotite may be represented by the formula $N(FeS)_x(FeS_2)_y(NiS)_z$.
4. "Magnetic separation will give a rich nickel concentrate."
5. "An ore with considerable gangue will yield more of its nickel as concentrate than will be the case with cleaner ore."
6. "The concentrate from clean ore will be of a higher grade than that from ore carrying much gangue."

7. "The nickeliferous portion of the mineral is attached to the gangue more firmly than is the non-nickeliferous portion."

8. "The nickel is possibly an essential constituent of the gangue instead of being a constituent of the pyrrhotite."

The line of reasoning indicated by the last five deductions seems to be about as follows: The nickeliferous portion of the Sudbury ore is non-magnetic; the diorite gangue is also non-magnetic; therefore nickel is possibly an essential constituent of the gangue. I have always had the impression that in scientific mineralogy the purity of the sample was of prime importance, and that in order to establish a theory of the composition of any ore it is necessary to examine the ore as a whole, to sample each mine or vein, to submit each sample to rigid investigation and analysis, and finally by correlating numerous facts to form a basis for a general conclusion. With the Gap ore I am not familiar, but as Dr. Emmens' deductions are intended to apply to the Sudbury ores also, with which I have considerable acquaintance, I will criticise their relation to these ores alone. As these numerous conclusions are based upon the analysis and magnetic behavior of one sample of Sudbury ore, containing 10.47% gangue, and as neither the location or further analysis of this ore is given, I am forced to conclude that Dr. Emmens has—as in the case of his three new minerals, blueite, whartouite and folgerite—fallen into the common error of hasty generalization from imperfect premises. The Sudbury ore veins are so large and of such varied analysis that to study them thoroughly is a labor of many months, if not years. While I am perfectly willing to acknowledge my ignorance on many points concerning these interesting ores, I may say that their practical relations have been my study nearly three years, and during that time certain conclusions have been forced upon me which may be of general interest.

In the first place, nickel is most emphatically not a constituent of the gangue. The rock through which the Sudbury ore has reached the surface is a black diorite. It contains the merest trace of nickel, barely giving a dark color where five grains are treated with ammonium sulphide. The rock picked from the mine output and set aside for future sorting contains about 0.8 Cu and 0.7% Ni, which is scattered through the mass in fine stringers or shots of ore. To show the unreasonableness of the theory suggested by Dr. Emmens, I will state that for several years the Canadian Copper Company has been sorting its ores, making four grades of the mine output. This work is done by mere boys, who, judging by the eye alone, separate, 1, the average mixed copper-nickel ore; 2, the copper pyrites; 3, the pyrrhotite or nickel ore, and, 4, the rock or diorite. What results are obtained will be seen by the following averages:

	Cu. per cent.	Ni. per cent.	Total Cu. Ni. per cent.	Cu. in total Cu. Ni. per cent.	Ni. in total Cu. Ni. per cent.
Copper cliff mixed ore.....	5.69	4.75	10.44	51.5	45.5
Stobie mixed ore.....	2.21	2.28	4.49	49.2	50.8
Evans mixed ore.....	2.60	4.0	6.60	39.3	60.7
Copper cliff picked Cu. ore.....	14.13	2.74	16.87	83.7	16.3
Stobie picked Cu. ore.....	15.71	1.23	16.99	92.4	6.6
Evans picked Cu. ore.....	13.85	1.34	15.20	91.9	8.9
Copper cliff picked Ni. ore.....	.80	8.12	8.92	90	91.0
Evans picked Ni. ore.....	.49	5.36	5.85	84	91.6
Average diorite rock.....	0.8	0.7	(contained as shots of ore)		

The fact that in the picked pyrrhotite or nickel ore from the Copper Cliff mine the nickel is 91% of the total copper-nickel contents, while in the same mine before sorting it is only 45.5% of the two metals, shows very conclusively that nickel is not a constituent of the diorite, but that it always accompanies and is found in the pyrrhotite whether it be an essential mineralogical constituent thereof or not.

The constitution of this pyrrhotite in which nickel is found in practice to be contained is a very interesting study. It is, I believe, universally granted that the Sudbury ores are of intrusive volcanic action, having been in most cases thrust up between diorite and syenite, or other similar igneous rocks. The ore must, therefore, have contained both nickel and copper in solution in the molten iron sulphides. As is usual in such cases, a sudden cooling would bring about a very close-grained texture and imperfect separation of minerals, as is the case with Stobie surface ores, while where slow cooling has taken place a gradual crystallization and more perfect separation has been possible. This is very clearly shown on the lower levels of the Copper Cliff and Evans mines. On the seventh level of the Copper Cliff mine a very large mass of pyrrhotite almost entirely free from copper pyrites and averaging 10% nickel was discovered. This ore is a typical nickeliferous pyrrhotite. Even a cursory examination of this ore will show the presence of a bronze yellow mineral of lighter color than the pyrrhotite, but not so bright yellow as pyrites. This bronze mineral has a somewhat different fracture from the pyrrhotite, from which it has separated in patches from a minute crystal up to spots 1/2-in. in diameter. The fracture of this mineral is irregular, but some broken fragments show distinct octahedral forms. It is non-magnetic, and can be separated from the pyrrhotite by rough crushing and hand picking after preliminary removal of the magnetic portion of the ore. On the lower levels of the Evans mine this mineral is found in great abundance. An analysis of the roughly sorted large grains from Copper Cliff mine gave nickel (with trace Co) 35.0; iron, 30.3; sulphur, 33.5. A sample very carefully selected from the Evans mine ore gave nickel 34.90; iron, 29.6; sulphur, 33.35; residue consisting of siliceous gangue. This agrees quite closely with the Sudbury pentlandite described by Mr. S. L. Penfield in the "American Journal of Science" for June, 1893, which contained nickel 34.23; cobalt, 0.85; iron, 30.25; sulphur, 33.42. The ratio of sulphur to nickel and iron is 1:1, which shows the composition to be (Ni Fe Co) S.

Being non-magnetic, this mineral can be separated by a magnet from the accompanying pyrrhotite, but the fact that the fine dust of

one portion clings to and fouls the other makes separation by this means very imperfect. A large number of our ores have been magnetically separated, and the non-magnetic portion of every ore yet tested shows a close resemblance in appearance and analysis to the pentlandite before described. I have never yet found a non-magnetic residue of the analysis given by Dr. Emmens: Nickel, 23.16; iron, 33.92; sulphur, 42.92. A few specimen analyses will show the mineralogical and practical relation of magnetic separation to the Sudbury ores. The samples were crushed to pass a 60-mesh sieve, experiment having shown that a very fine powder did not yield such perfect separation:

COPPER CLIFF MINE, SEVENTH LEVEL, PICKED NICKEL ORE.

Analysis, total ore.	Mag-netic.	Analysis, magnetic.	Non-magnetic.	Analysis, pyrrhotite.	Nickel in magnetic pyrrhotite.	Nickel in non-magnetic pentlandite.
Cu.... 0.00	78.0%	0.00	21.4%	0.00	34%	66%
Ni.... 11.00		4.62		35.05		
Fe.... 50.40		53.70		29.80		
S.... 38.01		38.58		34.35		

The residue in all cases consisted of a small amount of silicious gangue.

STOBIE PICKED NICKEL ORE.

Analysis of total ore.	Mag-netic.	Analysis, magnetic.	Non-magnetic.	Analysis, pyrrhotite.	Nickel in magnetic pyrrhotite.	Nickel in non-magnetic pentlandite.
Cu.... 0.00	97.175%	0.00	2.825%	0.00	72%	28%
Ni.... 2.75		2.15		31.70		
Fe.... 58.0		57.0		29.9		
S.... 35.35		36.10		33.90		

EVANS MINE, PICKED NICKEL ORE.

Analysis of total ore.	Mag-netic.	Analysis, magnetic.	Non-magnetic.	Analysis, pyrrhotite.	Nickel in magnetic pyrrhotite.	Nickel in non-magnetic pentlandite.
Cu.... trace	84.04	0.00	15.96%	.10	35.47%	64.53%
Ni.... 9.02		3.82		31.12		
Fe.... 51.50		56.0		29.35		
S.... 39.28		40.18		35.43		

As is evidenced from the above figures, the close-grained Stobie ore shows the lowest percentage of nickel separated in the non-magnetic portion, while in Evans and Copper Cliff ore, which are of coarser texture, about two-thirds of the total nickel is thus separated.

Grouping the non-magnetic portions of the Sudbury ores together for the purpose of comparison the uniformity is at once apparent:

	Ni.	Co.	Fe.	S.	
Copper Cliff.....	35.05		29.8	33.35	These samples contained some pyrrhotite as fine dust.
Stobie.....	34.70		29.9	33.90	
Evans.....	34.12		29.35	33.43	
Hand-picked Copper Cliff mineral.....	35.0		30.3	33.50	These samples were hand-picked and free from pyrrhotite.
Pentlandite from Sudbury ore:					
Mr. Penfield's analysis.....	34.23	0.85	30.25	33.42	
Evans handpicked pentlandite.....	34.90		29.6	33.35	

As is evident, the mineral is a pentlandite of one composition nearly (Ni Fe) S, and in this form about two-thirds of the nickel in Copper Cliff and Evans and one-third the nickel in the Stobie ore seems to exist. The proportion of this mineral seems to increase with the depth of the mine, and while I have never found it in mass the segregation of pentlandite seems also to increase with the depth. Samples taken this month from the Evans mine show numerous patches of this mineral over 1 in. in diameter on the accompanying pyrrhotite.

What the exact composition of the nickel in the ore, not separated as pentlandite, is, has yet to be determined. It is noticeable, however, that from the magnetic portion of Sudbury ores further crushing and magnetic separation yields a highly nickeliferous residue, which would seem to show that yet a further portion of pentlandite remains with the pyrrhotite in such minute particles as to render magnetic separation impossible. Nickel and iron replace each other in so many minerals that it is, however, very probable that the magnetic portion of Sudbury ores carries nickel, in part at least, as an essential constituent of the pyrrhotite.

The Vermilion nickel ore does not possess the same character as the Stobie, Evans and Copper Cliff ores. The fact that it is non-magnetic led me to search for pentlandite therein, but the search has been unavailing. A good sample of gray Vermilion ore analyzed, after deducting about 1.5% silica: Copper, 4.47; nickel, 36.85; iron, 18.70; sulphur, 38.43. After deducting the copper as calcopyrite, we find the pure Vermilion nickel mineral contains: Nickel, 43.09; iron, 17.26; sulphur, 39.76. As the ratio of iron and nickel to sulphur is nearly (Ni Fe) S₂, this mineral cannot be considered a pentlandite.

To sum up these conclusions, it would seem that near the surface and where the nickel-copper ores occur as an overflow of an eruption, the nickel exists mainly as an element replacing iron in pyrrhotite. The finer grained the ore, and hence the more rapidly it has been cooled from its original fused condition, the more nickel exists in this condition. The coarser grained the ore, on the other hand, and the deeper it lies below the surface, the more nickel exists as pentlandite, separated from the pyrrhotite. This conclusion is corroborated by furnace practice. The bottoms of old fore-hearths, or wells, are often found coated with a very tough matte, which contains nearly twice as much nickel as the matte which has been made with that fore-hearth. When kept molten for a long time nickel shows this tendency to segregate with iron and sulphur. I have never found in mattes a separation of a nickel mineral analogous to pentlandite; in fact, the only artificial mineral yet found in matte is a very remarkable ferro-nickel which contained Fe 45.64, Ni 54.36, occurring in triangular tin-white, malleable leaves or crystals, as described in the "Journal of Analytical Chemistry" of March, 1892. A further examination of the behavior of copper-nickel mattes under various conditions of heat and pressure would in all probability furnish a complete explanation of the almost identical problem of the separation of copper-nickel ores and their mineralogical relations in the Sudbury ore deposits.

FORNACES FOR THE OPEN-HEARTH STEEL PROCESS.*

By H. H. Campbell.

(Concluded from page 546.)

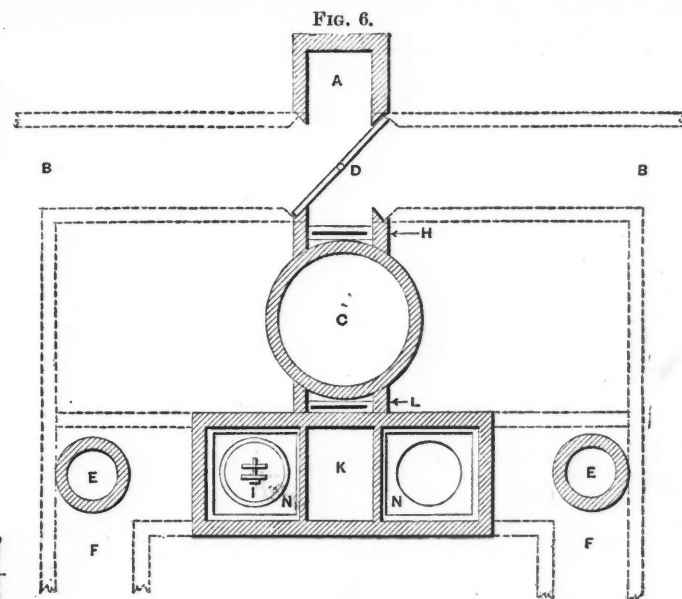
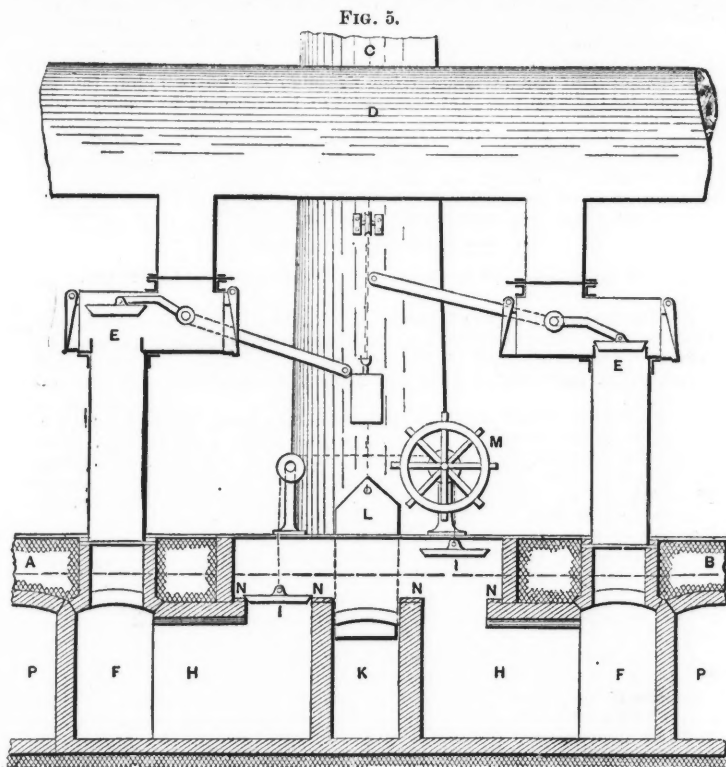
In operation through suitable valves the gas enters a regenerative chamber built of brick, with thick walls, and filled with brickwork so laid that a large amount of heating surface is exposed, while at the same time free passage for the gas is assured. The air enters a similar chamber. As the bricks in both chambers have been previously heated, the gas and air, in passing through them, are raised very nearly to the temperature of the surfaces with which they have been in contact. The air and gas meet just before reaching the melting-chamber, and produce a flame which travels over the hearth. The resulting products of combustion pass to the stack through chambers similar to those through which the gas and air entered. After the brickwork in the first set of chambers has been partially cooled by the incoming gases, the currents are reversed by means of suitable valves, and the gas and air enter the furnace by way of the chambers, which have been heated by the products of combustion. By the repeated reversal of the currents, the chambers are kept at a temperature of about 1,200° C., and this, therefore, is the temperature of the gas and air entering the combustion chamber.

The working of the furnace depends very much upon the arrangement of the ports through which the gases come and go. The gas should enter below the air, because, being the lighter, mixture is thereby facilitated, and also because this arrangement does not expose the metal on the hearth to a stratum of air and cause excessive oxidation. The point where the two gases meet should be about 5 ft.

culty with the gas, since this is often under a slight pressure when it enters the valves; but it will be found advantageous to force the air with a blower. The difficulty in making the gases enter the furnace will be more serious toward the end of a run or campaign, since the spaces between the checker-bricks become more and more filled with a deposit brought over by the products of combustion. This deposit is composed of the dust of material thrown into the furnace—sand, dirt, rust, scale, lime, ore, etc., and also of the fine globules of metal projected from the bath by the violence of the carbon-reaction, which particles, being immediately converted into oxide of iron, are swept along toward the stack. The deposit, therefore, consists largely of very fine iron oxide.

The respective areas of the gas and air ports must be proportioned to the kind of gas used, as the composition of the gas will determine the required volume. The proper amount of air and the volume of the products of combustion will not vary directly with the quality of the gas. At first sight, the volume of the products of combustion would appear to be a matter of no practical importance; but it must be remembered that all these products escape through the same ports and passages that admit the gas and air, and also that the entering gases are in compression, while the outgoing products are under tension, and that being also heated to a very much higher temperature their volume is considerably expanded. Since the working of the furnace will be determined by the amount of fuel that can be burned, it follows that the facilities provided for the escape of the burnt gases will be one of the main factors in its success.

The part of the furnace containing the hearth should be built of steel plates with tight riveted joints. Every bottom, when broken up after long use, shows that melted metal has penetrated through cracks and found its way to the inclosing shell. If such wandering



CAMPBELL'S GAS REVERSING VALVES FOR OPEN-HEARTH STEEL FURNACES.

from the metal; if much less than this, combustion can hardly begin before it is checked by contact with the cold stock; if much more, and if the burning mixture is conducted between conining walls, the brickwork will be rapidly melted. Some difficulties are overcome by making the roof extremely high and keeping the flame clear of the metal, trusting to radiation for heat. All other things being equal, the oxidation in a furnace of this design will be reduced to a minimum, and for some purposes this is a most important consideration. In certain cases it has been found that the time of the operation is lengthened by the high roof. This would naturally be expected, and where it is not the case, a comparison may possibly have been made with a bad previous practice, in which the gases rolled aimlessly into the working-room and into direct contact with the charge.

Both gas and air should enter the combustion-chamber under a positive pressure, forcing them into contact with each other, and throwing the resultant flame across the furnace in such a way that the draught of the stack on the outgoing end can pull it down through the ports without its impinging against the roof. A prevalent idea among furnace men is that the draught of the stack pulls the gases into the furnace. This is entirely wrong. Some furnaces may have been built in that way, but they are beneath consideration. A slight outward pressure at the door-openings is essential to good work, and such a pressure cannot possibly be caused by a pulling action of the stack. When the vertical distance from the port to the flue where the gas or air enters is 15 ft. or more, the force of the upward push due to the hot brickwork will create sufficient pressure; but with furnaces that are surrounded by a working-floor on the general level, the ascending power of the currents will be very weak unless the chambers are sunk to unusual depths. There may not be much diffi-

steel comes in contact with a cool plate, it spreads in a thin film until it fills the vacant space and then chills; but if in the area covered (which may possibly be several square feet) there is an unclosed rivet-hole, a continuous stream of steel may be started from the bath that will enlarge its channel with startling rapidity and in a few minutes empty the whole heat upon the ground. For the same reason the shell is carefully lined with layers of bricks with joints broken, and on this lining the true bottom is built.

In acid work this bottom is made by spreading sand in successive layers and hardening each layer by exposure to a full working-temperature. In basic work, the bottom is sometimes built up in this manner of magnesite or dolomite, but generally it is rammed or laid in while the furnace is cold.

In the ordinary stationary furnaces, the tap-hole is of necessity at the lowest point of the bottom, and must be closed by refractory material so mixed and set that it will not break open during the melt, yet soft enough to allow a bar to be driven through it to tap the charge, and solid enough to resist erosion while the metal is running out. In basic work especially, this combination is not easily attained. In the construction shown in Figs. 3 and 4, the tap-hole is placed above the slag-line, and the charge is poured by tilting the furnace on its rockers. The bath of metal, when melted, should be from 15 to 24 in. in depth. If it is shallower, the oxidation is excessive; if deeper, the time of melting and working is prolonged.

The admission of gas and air to the chambers is regulated by some simple form of throttle-valve. In addition, reversing valves are necessary to direct the course of the currents. The itinerary of the journey made by the gas and air separately is as follows: Through the regulating valve and through the reversing apparatus into a regenerative chamber, and thence into the furnace; then jointly, as products of combustion, from the furnace into the second set of regenerative

*Abstract from paper on the "Open-Hearth Steel Process," read before the Engineering Congress in Chicago.

chambers, and through the reversing apparatus into the stack. For the complete control of this system, the ordinary four-way butterfly-valve (shown in Fig. 2) is theoretically a perfect mechanical contrivance. Its simplicity, its neatness, the ease with which it is manipulated and the small space which it occupies, have led to its general adoption and to an equally general unwillingness to recognize its radical and irremediable defects. From the nature of the case, it is exposed on one side to the incoming gases and on the other to the escaping products of combustion. The waste gases should not be hot in ideal work, but, unfortunately, circumstances will occur in practice whereby for a short time they pass to the stack at a temperature of redness. The inevitable result is a warping of the valve or its enclosing box. The same result may be effected by a leakage of gas, if soot or tar should clog the seat unequally, or if air should leak in and burn the gas in the valve-box. When once the valve is warped, the destructive action is cumulative, since gas leaks and burns continually at the opening. It is a most objectionable feature that this leak does not show itself openly in any way; but more vital is the fact that there is no way of remedying the difficulty without complete replacement of the valve or box. Adjustment is impossible when a fixed pivot and two metal seats are in question. Water-cooling has been tried with some success, but it should be applied to both the box and valve. The better way is to construct an entirely different type of valve, shaped to withstand unequal heating and provided with means by which the injured parts may be easily replaced. Many such arrangements have been devised. Fig. 5 shows a form designed by the author; it is quite possible that in some other corner of the world it has been used before. This drawing is a vertical section through gas reversing valves, the references being: C, stack; D, main gas tube; E, E, branch gas tubes, showing valves; F, F, gas chambers; H, H, gas chamber flues to reversing valves; I, I, stack reversing valves for gas; K, flue from reversing valves to stack; L, stack damper for gas; M, valve reversing gear; N, N, water-cooled valve seats; P, P, air chambers. In Fig. 6, which is a horizontal

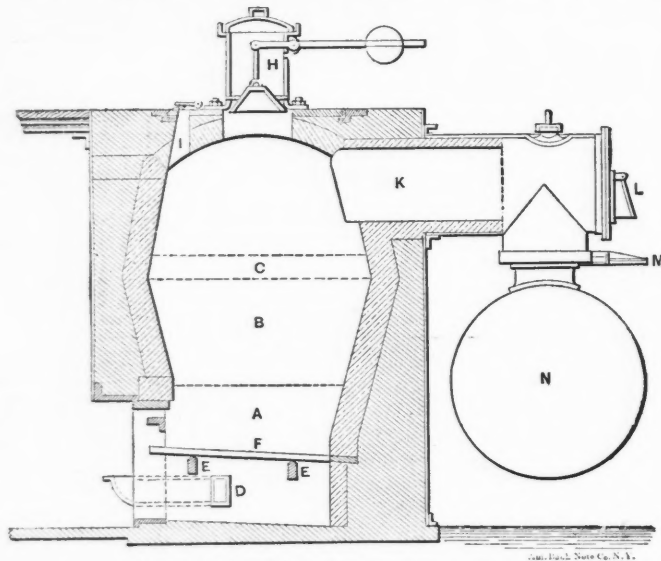


FIG. 7.—THE WELLMAN GAS PRODUCER.

section on line A, B, Fig. 5, the reference letters are: A, air inlet; B, B, air chambers; C, stack; D, air reversing valve; E, E, gas inlets; F, F, gas chambers; H, stack damper for air; I, stack reversing valve for gas; K, flue from reversing valve to stack; L, stack damper for gas; N, N, water-cooled valve seats.

In addition to the valves which determine the influx of the gases, dampers are provided to regulate the flow of the waste products. Not only must the total pulling power of the stack be controlled, but there should be some arrangement by which the gas and air chambers can be governed separately. This is necessary because the amount of waste products passing through any particular chamber determines the temperature of that chamber, which in turn determines the temperature of the gas it delivers to the furnace. During the run of a furnace it often becomes necessary to alter the relative amounts delivered to the various outgoing passages; but as tight seals are unnecessary, no complicated apparatus is required.

For handling the metal and slag after tapping, various systems are in use, and no particular one can be declared unconditionally the best. The weight to be handled, the sizes of ingots to be made, the number of furnaces, and the available room will all be factors in the problem. To the mechanical engineer the traveling-crane seems the true solution, but the metallurgist condemns it, as the multiplicity of parts makes breakages too frequent. In the machine shop such accidents may not be serious, but in an open-hearth plant they may be disastrous. If a charge cannot be tapped when it is ready, the metal oxidizes, scorification of the bottom ensues, and the whole heat may break out and be lost. Relief may be obtained by adding pig-iron, but it is only temporary, and if the metal is allowed to chill it may be given up as lost, so far as a successful cast is concerned. In such a case most furnace men would like to pour it into a bottomless pit. In case of a breakage of the supporting chains with a charge in the ladle, the possibilities are appalling; 25 tons of steel flowing over tracks and molds, around ladders and engines, fastening them inseparably together and chilling into an unbreakable mass—all this is beneath consideration when the danger of human life is counted.

Confronted with these conditions, the metallurgist has used the

hydraulic crane, and each year has made it safer and stronger. The cylinder should be large enough for twice the load it will ever be called upon to lift, and the superstructure must be able to withstand the utmost pressure of the cylinder. Struts should be used as far as possible instead of tie-rods, and all the parts should be made of rolled-steel shapes. In such a crane the only place of weakness is the connecting water-pipe, and the breakage of this involves merely a slow descent of the load. The introduction of an electric traveler, with a hydraulic lift and pump carried on the bridge, offers for the first time a combination of the above-described elements of safety, with the evident advantages of the travelling-crane class.

In providing fuel for use in the furnace, soft coal can be converted into gas by burning it in a thick fire, the products being carried through tubes to the furnaces without the intervention of a receiver. The forms of apparatus devised for this work are many, differing only in detail. Fig. 7 shows the Wellman producer, the design of one of our most practical engineers. It is a modified form of the old Siemens type, with a steam blast attachment, and fulfills the following requirements, which every good producer should meet: 1. Each fire is independent, and leakage from one to another cannot occur. This renders it possible to repair any particular producer at any time. 2. It is constructed in the strongest possible manner. A circular form is the easiest to keep in shape, and a continuous inclosing envelope of rolled steel cannot be improved upon. 3. The coal is dumped in the center of the fire, and poking is reduced to a minimum. 4. The stepping back of the brickwork from the grate bars partially overcomes the tendency of the air to creep up the walls. 5. Ample provision is made for putting in a false grate by pushing bars through the fire above the ashes in such a manner that they act as a grate while the clinkers below are removed. 6. During this operation the fire must be separated from the main receiving tube, else the gas will back down through the fire on the workmen. The isolated position of each producer renders it easy to provide a separating damper for each fire. 7. By means of the steam jets the relative amounts of air and steam can be regulated to obtain the best results. 8. The gas is taken from the side of the cylinder, the top thus being left clear, so that every part of the fire can be reached with a poker.

Fig. 7 shows a vertical section through center of a Wellman gas producer. The references in the drawings are: A, ash zone; B, combustion zone; C, distillation zone; D, steam blower; E, bearing bar; F, grate bar; H, hopper; I, stoking hole; K, neck to gas main; L, door for cleaning neck; M, damper; N, gas main.

THE ROESSLER-EDELMANN PROCESS OF LEAD DESILVERIZATION.

We are indebted to the Roessler & Hasslacher Chemical Company, of New York, for the following additional information concerning the Roessler-Edelmann desilverizing process, which has previously been described in the "Engineering and Mining Journal" of September 24, page 245.

This process, which has now been in operation for two years at Hoboken, near Antwerp, Belgium, works very satisfactorily, being simple in practice, and saving time, labor and material. It reduces the losses in lead, silver and zinc, and increases the capacity of the plant, while the zinc produced is of a highly refined quality, approaching chemical purity. The process consists of two parts:

1. Desilverizing the lead by means of an alloy of zinc and about 0.5% aluminum, from which results refined lead on the one hand, and a homogeneous zinc-silver alloy on the other.
2. Working up the zinc-silver alloy to refined silver and refined zinc.

The advantage of using the zinc-aluminum alloy is explained as follows:

1. The quantity of zinc required for complete desilverization depends on the quantity of silver present in the lead, assuming that comparatively pure ("softened") silver-lead is to be treated.

2. The quantity of spelter which the molten lead is capable of absorbing depends on the temperature of the latter; the higher the temperature the greater its capacity for taking up spelter.

3. At the temperature required for complete desilverization at one operation, without much stirring, the ordinary spelter unavoidably oxidizes; the oxide covering the spelter prevents the complete solution of the latter in the lead bath, the result being the production of a dirty mass of zinc oxide, zinc, lead and silver (called zinc scum), which is comparatively poor in silver and rich in lead, and offers many difficulties to the subsequent operations for extracting the silver.

4. An alloy of zinc with 0.5% of aluminum does not oxidize at the temperature required for the desilverizing process. A complete desilverization of the silver-lead is therefore possible at one operation, without much stirring. An excess of zinc is not required.

The resulting alloy is perfectly free from oxide of zinc; there is no difficulty in liquating the excess of lead; an alloy rich in silver is produced, and consequently the bulk of the stuff to be treated for its recovery is proportionately diminished.

In carrying out the process, the zinc-aluminum alloy, which has to be prepared previously, is thrown upon the lead bath, when the latter has acquired the necessary temperature, which varies somewhat according to the contents in silver, but is about 400° to 500° C. Then the whole is stirred and allowed to cool, whereupon the molten lead, which at the low temperature is no longer capable of holding the zinc, gives it up again. The free zinc, having in the meanwhile taken up the silver, rises to the surface of the bath, whence it, together with some lead, is ladled off. In order to get rid of the excess of lead, the alloy is charged into a cast-iron pot with an outlet at the bottom, and slowly heated, liquating and drawing off the greater part. Subsequently the temperature is raised to red-heat for melting the zinc-silver alloy as well as for separating it from the remainder of lead present, the former floating on top of the latter, whence it is ladled, care being taken not to touch the lead under-

neath, which is drawn off subsequently. The zinc-silver alloy consists of 20-40% silver, according to the richness of the silver lead treated, 5% lead, 2-4% copper and 70-80% zinc. It amounts to about 2% of the silver-lead treated, while by the old process about 15% zinc scum consisting of 4 to 6% silver, 70 to 80% lead, 0.5% copper and 10% zinc was produced.

For working up the zinc-silver alloy there are two ways. The first is to treat the granulated alloy by hydrochloric or dilute sulphuric acid, whereby the zinc is got as a salt, and the silver in the shape of slime. The second way is by electrolysis, whereby the spelter is obtained as a metal of high purity, consisting of 0.0099% to 0.0044% Fe, 0.0114% to 0.0210% Cu, 0.0341% to 0.0500% Pb, from a trace to 0.0020% Ag, and 99.9446 to 99.9226% Zn. This metal, of course, commands a price much higher than that of ordinary spelter, this gain nearly covering the cost of electrolysis.

The electrolyte consists of a solution of chloride of zinc in chloride of magnesium. Its specific gravity is about 1.2 to 1.27. The cathodes are vertical circular sheets of metallic zinc fixed upon a horizontal spindle, the latter revolving just above the surface of the bath. The spelter is thereby obtained in sheets.

The residue of the anodes, got in the shape of slime, after the electrolytic extraction of the zinc, consists of about 75% Ag, 12% Pb, while the chloride of silver is reduced at the same time to the metallic state by iron shavings. The silver slime now contains nearly 15% of and lead. A small quantity of chloride of silver is also formed. The oxides of copper, zinc and iron are dissolved in very dilute H₂SO₄, while the chloride of silver is reduced at the same time to the metallic state by iron shavings. The silver slime now contains nearly 15% of lead, some copper, and 80 to 85% of silver. It is smelted upon a cupel, whereby the remainder of the lead is oxidized and separated as litharge.

Two hundred kilos of silver slime are refined in eight hours, and it is possible to refine three charges in 24 hours. Cupellation is done away with by the new process, and with it the reviving of litharge and other by-products. In lieu of it there is only the short refining process on the cupel. As there is only a very small quantity of litharge produced, practically the whole of the silver-lead is worked at once into refined lead, so that no subsequent desilverization of the revived bullion, as hitherto, is required.

MOLYBDENUM STEEL.*

Many experiments have been made in search of an alloy that will be as hard as tungsten steel and at the same time more malleable and less brittle. Uranium, titanium and cerium have been proposed and used for this purpose, but their costliness removes them from consideration. Attention was then turned to the employment of molybdenum, which metal is nearly related to tungsten. Metallic molybdenum, as formerly prepared, being so expensive that even its use in experimental work was precluded, ferro-molybdenum was tried as a substitute. This was made by roasting molybdenite (sulphide of molybdenum) and smelting the oxide with iron, the resulting alloy containing 10% molybdenum. It was found impossible, however, to prepare it free from sulphur and phosphorus, and it was, therefore, unserviceable.

Recently a new process of molybdenum-winning was introduced by Sternberg & Deutsch at their chemical works at Grunau, near Berlin, whereby metal 96 to 98% pure has been brought into the market at 8 marks (\$1.90) per kilo., or 86½ cents per pound.

The new process consists in reducing molybdate of lime, which is easily obtained pure, with carbon. The lime is then separated from the metallic molybdenum formed by means of chlorhydric acid. The molybdenum obtained in this manner contained about 3% carbon, but no other impurities.

Experiments have shown that only about half as much molybdenum as tungsten is required to produce the same effect on steel, a fact which is in accordance with the atomic weights of the two metals, molybdenum being 95.8 and tungsten 184. Steel with 2% molybdenum is silver-white in color, has a velvety fracture, and is extraordinarily hard. Experiments are to be made with the new alloy on a larger scale.

Platinum Veins in the Oural.—A recent account from Russia says that the alluvial deposits of Nijny-Taguilsk on the western slope of the Oural, in the basins of the rivers Visim, Martiane and Tchaouj have long been celebrated for the platinum they yield, consequently Mount Solovieff, where these rivers rise, has for some time past been systematically prospected for the platinum reefs, from which the alluvial platinum has been derived; these researches, however, have proved unsuccessful; but last summer an inclusion 13 in. in diameter, was encountered by accident; it consisted of chrome iron and serpentine in alternate bands associated with a small quantity of dolomite and some disseminated angular fragments of country rock. Visible grains of native platinum could be distinguished in the rocks of the inclusion by means of a lens, but even the rock in which no platinum grains could be seen was found to contain 0.0107 per cent. of that metal. The platinum is therefore present in microscopic accumulations. The country rock of Mount Solovieff consists of angular grains of olivine cemented by clear green serpentine and besprinkled to a small extent with grains of chrome iron; it may be regarded as the variety of peridot known as dunite; this is sometimes massive when in contact with the including rocks, and at other times shattered and penetrated by the latter. Daubree regards the finding of platinum in the rocks where it is invisible as an interesting new fact, while the above remarks about the general character of the rocks, Mr. D. A. Louis says, confirm observations made by him on specimens from Nijny-Taguilsk.

THE PROPOSED NEW TARIFF BILL.

On November 27th Chairman Wilson, of the Ways and Means Committee, gave to the press the text of the bill prepared by the committee for submission to Congress. We give below that portion of the schedules of the bill which affects the mining, mineral and chemical industries, and in which our readers will be specially interested. For the comparisons made with the old rates of the existing tariff law, generally known as the McKinley law, we are much indebted to the enterprise of the New York "Times." It will be remembered, of course, that these schedules are those proposed by the committee and have still to pass the ordeal of the debates in Congress.

Article.	McKinley Bill.		Wilson Bill.			
	Rate	Ad. Val Equiv.	Rate	Ad. Val Equiv.	Dec.	Inc.
Boracic acid.....	5c. per lb.	89.00				
Chromic acid.....	6c. per lb.	16.37	10 p. c.	10.00	6.37	
Sulphuric acid, not otherwise provided for.....	¼c. per lb.	4.33	Free.			
Tartaric acid.....	10c. per lb.	20.00	20 p. c.	20.00		
Alumina and alum compounds.....	6-10 of 1c. per lb.	41.87	20 p. c.	20.00	21.87	
Carbonate of ammonia.....	1¼c. per lb.	26.41				
Muriate of ammonia.....	¾c. per lb.	14.28				
Sulphate of ammonia.....	¼c. per lb.	20.98				
Blue vitriol.....	2c. per lb.	28.06				
Bone char.....	25 p. c.	25.00				
Borax, crude, borates of soda and lime.....	3c. per lb.	20.00				
Borax, refined.....	5c. per lb.	46.00	20 p. c.	20.00	26.00	
Camphor, refined.....	4c. per lb.	13.00				
Chalk, prepared, French and red.....	1c. per lb.	33.00	20 p. c.	20.00	13.00	
Chalk, not specially provided for.....	20 p. c.	20.00				
Chloroform.....	25c. per lb.	58.33	25c. per lb.	58.33	15.00	
Coal tar colors or dyes.....	35 p. c.	35.00	20 p. c.	20.00		
Coal tar preparations not colors or dyes.....	20 p. c.	20.00	20 p. c.	20.00		
Cobalt oxide.....	30c. per lb.	15.41				
Copperas, or sulphate of iron.....	3-10 of 1c. per lb.	57.25				
Ether, sulphuric.....	40c. per lb.	141.33	25c. per lb.	88.45	52.88	
Ether, nitrous, spirits of.....	25c. per lb.					
Gelatine, glue, and isinglass, not above 7c. per pound.....	1½c. per lb.	27.68	25 p. c.	25.00	2.68	
Gelatine, glue, and isinglass, above 7 and not above 30c. per pound.....	25 p. c.	25.00	25 p. c.	25.80		
Gelatine, glue, and isinglass, above 30c.....	30 p. c.	30.00	25 p. c.	25.00	5.00	
Glycerine, crude.....	1¼c. per lb.	31.84	1c. per lb.	18.20	13.64	
Glycerine, refined.....	1¼c. per lb.	50.48	3c. per lb.	33.66	16.82	
Iodine, resublimed.....	30c. per lb.	8.57				
Iodoform.....	\$1.50 per lb.	4.11	\$1 per lb.	2.74	1.37	
Magnesia, carbonate of.....	4c. per lb.	52.48	3c. per lb.	39.36	13.12	
Magnesia, calcined.....	8c. per lb.	30.91	7c. per lb.	37.05	3.80	
Magnesia, sulphate of.....	3-0 of 1c. per lb.	26.40				
Morphia, oporhine, and salts.....	50c. per oz.	45.81	50c. per oz.	45.81		
Paints, Colors and Varnishes:						
Baryta sulphate and barytes, unman.....	\$1.12 per ton	36.42				
Baryta sulphate and barytes, man.....	\$5.62 per ton	62.94	\$3 per ton.			
Blues, con. ferrocyanide of iron.....	6c. per lb.	18.91	6c. per lb.	18.91		
Blanc-fixe, or satin white.....	¼c. per lb.	51.90	25 p. c.	25.00	26.90	
Black, bone, ivory or veg.....	25 p. c.	25.00	20 p. c.	20.00	5.00	
Chrome yellow and comp. of chrome, in oil.....	¼c. per lb.	27.89	25 p. c.	25.00	2.89	
Ochre and ochrey earths.....	¼c. per lb.	24.72	¼c. per lb.	24.72		
Ochre and ochrey earths ground in oil.....	1¼c. per lb.	13.44	1¼c. per lb.	11.20	2.21	
Ultramarine blue.....	4¼c. per lb.	46.05	20 p. c.	20.00	26.05	
Varnishes, including Japan.....	35 p. c.	35.00	25 p. c.	25.00	10.00	
Spirit varnishes.....	35 p. c.	89.65	25 p. c.	80.68	8.96	
Vermilion red.....	12c. per lb.	24.48	20 p. c.	20.00	4.48	
Wash blue.....	3c. per lb.	19.80				
Whiting and Paris whites, dry.....	¼c. per lb.	83.86	25 p. c.	25.00	58.86	
Whiting and Paris white ground in oil.....	1c. per lb.	27.15	25 p. c.	25.00	2.15	
Zinc, oxide of, and paint, dry.....	1¼c. per lb.	25.68	20 p. c.	20.00	5.68	
Zinc, oxide of, and paint, ground in oil.....	1¼c. per lb.	28.83	20 p. c.	20.00	8.83	
Other paints.....	25 p. c.	25.00	25 p. c.	25.00		
Artists' water colors.....	30 p. c.	30.00				
Lead Products:						
Acetate of lead, white.....	5¼c. per lb.	65.44	30 p. c.	30.00	36.44	
Acetate of lead, brown.....	3¼c. per lb.	82.78				
Litharge.....	3c. per lb.	92.57				
Nitrate of lead.....	3c. per lb.	59.56	30 p. c.	30.00	29.56	
Orange mineral.....	3¼c. per lb.	75.94	35 p. c.	35.00	40.94	
Red lead.....	3c. per lb.	82.66	35 p. c.	35.00	47.66	
White lead and white lead paint.....	3c. per lb.	54.33	30 p. c.	30.00	24.33	
Potash - Hydriodate iodate, etc.....	18 41	25c. per lb.	9.20	9.21		
Nitrate.....	1c. per lb.	20.95	¼c. per lb.	10.47	10.47	
Bichromate and chromate.....	3c. per lb.	39.07	20 p. c.	20.00	19.07	
Prussiate red.....	10c. per lb.	32.24	20 p. c.			
Prussiate yellow.....	5c. per lb.	28.07	20 p. c.			
Phosphorus.....	20c. per lb.	54.12	25 p. c.	25.00	29.12	
Bicarbonate of soda, salcratus.....	1c. per lb.	57.39	¼c. per lb.	28.69	28.69	
Hydrate of soda.....	1c. per lb.	40.67	¼c. per lb.	20.33	20.33	
Chromate and bichromate of soda.....	3c. per lb.	47.85	20 p. c.	20.00	27.85	
Sal-soda.....	¼c. per lb.	24.84	¼c. per lb.	12.42	12.42	
Soda ash.....	¼c. per lb.	18.73	¼c. per lb.	20.14	20.14	
Sulfate of soda.....	¼c. per lb.	40.28	¼c. per lb.	20.14	20.14	
Sulphate of soda.....	\$1.25 per ton	5.01				
Sulphur, refined.....	\$8 per ton		20 p. c.	2.00		
Sulphur, sublimed.....	\$10 per ton	27.15	20 p. c.	20.00	7.15	
Sumac.....	4-10c. per lb.	19.16	10 p. c.	10.00	9.16	
Cream of tartar.....	6c. per lb.	48.59	25 p. c.	25.00	23.59	
Tartars and lees crystals.....	4c. per lb.	26.50	25 p. c.	25.00	1.50	
Tartrate of soda and potassa.....	3c. per lb.	17.35	10 p. c.	10.00	7.35	
SCHEDULE B.—EARTHEN, WARE AND GLASSWARE.						
Brick and Tile—						
Fire brick, not glazed.....	\$1.25 per ton	29.88	20 p. c.	20.00	9.88	
Fire brick, glazed.....	40 p. c.	45.00	50 p. c.	30.00	15.00	
Tiles and brick other than fire, not glazed.....	25 p. c.	25.00	25 p. c.	25.00		
Tiles and brick other than fire, glazed.....	45 p. c.	45.00	40 p. c.	40.00	5.00	
Roman cement, etc., in barrels.....	8c. per cwt.	21.99	8c. per cwt.	21.99		
Roman cement, etc., in bulk.....	7c. per cwt.		7c. per cwt.			
All other cement.....	20 p. c.	20.00	10 p. c.	10.00	10.00	
Lime.....	6c. per cwt.	29.54	10 p. c.	10.00	19.54	
Plaster of paris, ground.....	\$1 per ton	7.84	10 p. c.			
Plaster of paris, calcined.....	\$1.75 per ton	24.75	15 p. c.	15.00	9.75	
Clays, unmanufactured, not otherwise provided for.....	\$1.50 per ton	30.43				
Clays, wrought.....	\$3 per ton	26.43	\$2 per ton.	17.62	8.81	
China clay, kaolin.....	\$3 per ton	29.59	\$2 per ton.	25.40	4.19	
Gas retorts.....	\$3 each	21.02	20 p. c.	20.00	1.02	
Chemical glassware.....	45 p. c.	45.00				

* Translated and abstracted from "Stahl und Eisen," August, 1893.

The above rates show duties which it is proposed to levy. Below we give the free list, which, it will be seen, has been greatly extended, and has been made to include coal, iron ore and other important items.

THE FREE LIST.

Section 2.—On and after 1st day of March, 1894, the following articles when imported, shall be exempt from duty:

Acids, used for medicinal, chemical or manufacturing purposes. Agates, unmanufactured. Albumen. Amber, unmanufactured. Ambergris. Ammonia. Aniline salts. Antimony. Apatite. Argal, or crude tartar. Arseniate of aniline. Articles of growth, produce and manufacture of United States when returned after having been exported, without having been advanced in value or improved in condition. Asbestos, unmanufactured. Asphaltum and bitumen, crude. Assafoetida.

Baryta, including barytes earth. Bauxite. Bells, broken, and bell metal, broken and fit only to be remanufactured. Bismuth. Blood, dried. Blue vitriol, or sulphate of copper. Bolting cloth, especially for milling purposes, but not suitable for the manufacture of wearing apparel. Bones, crude or not burned, calcined, ground, steamed, or otherwise manufactured, and bone dust or animal carbon, and bone ash fit only for fertilizing purposes. Bone char, suitable for use in decolorizing sugars. Books, engravings, photographs, bound or unbound, etchings, maps, and charts, which shall have been printed and bound or manufactured more than twenty years, and all publications of foreign governments, and publications containing observations of scientific phenomena and the results of scientific observations. Books and pamphlets printed exclusively in languages other than English. Books, maps, lithographic prints and charts specially imported, not more than two copies in any one invoice, in good faith, for the use of any society incorporated or established for educational, philosophical, literary, or religious purposes, or for the encouragement of the fine arts, or for the use or by order of any college, academy, school, or seminary of learning in the United States, subject to such regulations as the Secretary of the Treasury shall prescribe. Books, libraries, usual furniture, and similar household effects of persons or families from foreign countries, if actually used abroad by them not less than one year, and not intended for any other person or persons, nor for sale. Borax, crude. Brazilian pebble, unwrought. Breccia, in block or slabs. Bromine. Bullion, gold or silver. Burgundy pitch.

Cabinets of old coins and medals, and other collections of antiquities. Cadmium. Calamine. Camphor. Cerium. Chalk, unmanufactured. Charcoal. Chromate of iron or chromic ore. Clay—Common blue clay, in casks, suitable for the manufacture of crucibles; clays or earths, unmanufactured, not specially provided for. Coal, anthracite, bituminous, and shale, and coal, slack or culm. Coke. Coal tar, crude, and all preparations and products of coal tar, not colors or dyes, not specially provided for. Cobalt and cobalt ore, and oxide of cobalt. Coins, gold, silver, and copper. Copper, imported in the form of ores. Old copper, fit only for manufacture. Regulus of copper and black or coarse copper, and copper cement. Copper in plates, bars, ingots, or pigs, and other forms not manufactured. Copperas, or sulphate of iron. Cotton ties, of iron or steel, cut to lengths, punched or not punched, with or without buckles, for bailing cotton. Cryolite.

Diamonds and other precious stones, rough or uncut, including glaziers' and engravers' diamonds, not set, and diamond dust or bort, and jewels to be used in the manufacture of watches or clocks. Dragons' blood. Emery ore. Feldspar. Fossils. Glass, broken, and old glass which cannot be cut for use, and fit only to be remanufactured. Glass plates or disks, rough cut or unwrought, for use in the manufacture of optical instruments, spectacles, and eye-glasses, and suitable only for such use. Gold-beaters' molds and gold-beaters' skins. Guano, manures, and all substances expressly used for manure. Hones and whetstones. India rubber, crude, and milk of, and old scrap or refuse India rubber, fit only for remanufacture. Iodine, crude and resublimed. Iridium. Iron ore, including manganiferous iron ore; also the dross or residuum from burned pyrites and sulphur ore, as pyrites or sulphuret of iron in its natural state. Jet, unmanufactured. Kieserite. Kyanite, or cyanite and kainite. Lava, unmanufactured. Lime, citrate of. Lime, chloride of, or bleaching powder. Lithographic stones, not engraved. Litmus, prepared or not prepared. Loadstones.

Magnesia, sulphate of, or epsom salts. Magnesite, or native mineral carbonate of magnesia. Magnesium. Magnets. Manganese, oxide and ore. Mica and metallic mineral substances in a crude state, and metals unwrought, not specially provided for in this act. Meerschau, crude or manufactured. Mineral waters, all not artificial. Minerals, crude or not advanced in value or condition by refining or grinding, or by other processes of manufacture, not specially provided for in this act. Models of inventions and of other improvements. Needles, hand-sewing and darning. Newspapers and periodicals. Nickel, nickel oxide.

Ocher and ochrey earths, sienna and sienna earths, umber and umber earths, not specially provided for in this act; dry. Ores of gold, silver and nickel, and nickel matte. Osmium. Palladium. Paraffin. Pearl, mother of, sawed, or cut, but not polished, or otherwise manufactured. Pewter and britannia metal, old, and fit only to be remanufactured. Philosophical and scientific apparatus, instruments, and preparations. Phosphates, crude or native. Plaster of paris and sulphate of lime, unground. Platina, in ingots, bars, sheets, and wire. Platinum, manufactured, and vases, retorts, and other apparatus, vessels, and parts thereof, composed of platinum, for chemical uses. Plows, tooth and disk harrows, harvesters, reapers, drills, mowers, horse rakes, cultivators, thrashing machines, and cotton gins. Plumbago. Polishing stones. Potash, crude, carbonate of, or "black salts." Caustic potash or hydrate of, including refined in sticks or rolls. Nitrate of potash, or saltpeter, crude. Sulphate of potash, crude or refined. Chlorate of potash. Muriate of potash. Professional books, implements, instruments, and tools of trade, occupation, or employment, in the actual possession at the time of persons arriving in the United States. Pumice.

Quicksilver. Quills, prepared or unprepared, but not made up into complete articles. Regalia and gems, statues, statuary, and specimens of sculpture. Salacine. Salt in bulk and salt in bags, sacks, barrels, or other packages, but the coverings shall pay the same rate of duty

as if imported separately, Provided, that if salt is imported from any country which imposes a duty upon salt exported from the United States, then there shall be levied, paid, and collected upon such salt the rate of duty now provided by law. Shotgun barrels, forged, rough, bored. Soap, all not otherwise specially provided for in this act. Soda, nitrate of or cubic nitrate, chlorate of, and sulphate of, or salt cake or nitre cake. Sodium. Specimens of natural history, botany and mineralogy, when imported for cabinets or as objects of science, and not for sale. Stone and sand, burr stone in blocks, rough or manufactured, or bound up into millstones, cliffstone, unmanufactured; freestone, granite, sandstone, limestone, and other building or monumental stone, except marble, unmanufactured or undressed, not specially provided for in this act; pumicestone, rottenstone, and sand, crude or manufactured. Storax, or styrax. Strontia, oxide of, and propoxide of strontian, and strontianite, or mineral carbonate of strontia. Sulphur, refined, lac or precipitated, and sulphur or brimstone, crude, in bulk, sulphur ore, as pyrites, or sulphuret of iron in its natural state, containing in excess of 25% of sulphur, and sulphur not otherwise provided for. Sulphuric acid. Sweepings of silver and gold.

Tar and pitch of wood, and pitch of coal tar. Terra alba. Terra Japonica. Tin ore, cassiterite, or black oxide of tin, and tin in bars, blocks, pigs, or grain or granulated. Tripoli. Types, old, and fit only to be remanufactured. Uranium, oxide and salts of. Verdigris, or subacetate of copper. Wax, vegetable or mineral. Whalebone, unmanufactured. Logs and round unmanufactured timber not specially enumerated or provided for in this act. Firewood, handle bolts, heading bolts, stave bolts, shingle bolts, hop poles, fence posts, railroad ties, ship timber, and ship planking, not specially provided for in this act. Timber, hewn and sawed, and timber used for spars and in building wharves. Timber, squared or sided. Sawed boards, planks, deals and other lumber. Pine clapboards. Spruce clapboards.

Works of art, drawings, engravings, photographic pictures, and philosophical and scientific apparatus brought by professional artists, lecturers, or scientists arriving from abroad for use by them, temporarily, for exhibition and in illustration. Works of art, collections in illustration of the progress of the arts, sciences, or manufactures, photographs, works in terra cotta, parian marble, pottery, or porcelain, and artistic copies of antiquities in metal or other material, hereafter imported in good faith for permanent exhibition at a fixed place by any society or association for the purpose of erecting a public monument. Zaffer.

MR. WILSON'S STATEMENT.

As the best explanation of the principles upon which the bill was prepared, we give below the statements made by Chairman Wilson in regard to the bill: "The Democratic members of the Committee on Ways and Means have felt as none others could feel the momentous responsibility resting upon them, and the magnitude, difficulty and delicacy of the duty assigned them of framing a tariff bill for a nation of 70,000,000 of people. The bill they were called on to reform is a vast and labyrinthian system of class taxation, the culmination of 30 years' control of the taxing power by a few great interests, gathering into their train a host of petty toll-gathering. It was carefully framed to prevent, as long as possible, what its author called 'any monkeying with the tariff,' by which he meant any successful effort of the people to undo or to lessen the bounties which its beneficiaries were permitted to write therein in their own words and their own figure. It transferred to the free list proper and fruitful revenue articles where most of the taxes paid by the people were received by the government, and greatly increased the rates of those articles where all or most of the taxes paid by the people went into private coffers. And it was bolstered about by many defenses, chief among which are a swept and garnished treasury and a swollen and colossal scale of permanent expenditure. Such are the conditions that confront us at the threshold of our work.

"The committee have welcomed information and counsel from every trustworthy source, and while they do not expect their bill to escape just criticism in all its details, they do present it to the country as the result of months of patient, anxious toil, and of an honest desire to discharge their duty, purged of all taint of local and personal favoritism or prejudice. Its main features are two:

"1. The adoption wherever it seemed practicable of ad valorem instead of specific duties.

"2. The freeing from taxes of these great materials of industry that lie at the basis of production.

"Specific rates of duty are objectionable for these reasons. They frequently conceal a rate of taxation too enormous to be submitted to if exposed in ad valorem terms, as the duty of 8 cents per 100 lbs. on salt in bulk, which amounts to over 80% on a common necessary of life. They always bear heavily on the common article used by the masses, and lightly on the expensive article consumed by the rich, as a tax of \$30 on all houses would be little or nothing on the great mansion and very high on the humble home. And contrary to common belief, specific duties lead to greater frauds in administration, for counting and weighing at the Custom House are done by the cheapest and most easily corrupted labor, while ad valorem rates are assessed by the best paid and most responsible appraisers.

"The ad valorem system has worked well in practice, is essentially the fair system, because it is a tax upon the actual value of an article, and was declared by Mr. Clay himself to be in theory, and according to every sound principle of justice, entitled to the preference, and vindicated by long trial.

"The boldest innovation of the bill is its large free list of raw materials. Taxes upon production are double wrongs. They gather and cumulate on the consumers of the finished product. They hurt labor by narrowing the market for what it produces. Coal and iron are the foundations of modern industry. Material progress is measured by the amount of their consumption. No other country can supply them as abundantly or cheaply as we can. No possible competition can interfere with our own producers a few miles in the interior of the country. Remoteness from the sources of supply is in itself enough disadvantage to any section of the country, without

further burdens in tariff taxes. Untaxed ores, coal, lumber, wool and other things must immensely stimulate production in certain parts of our country.

"The thin edge of American manufactures has entered every country. With releases from taxes on their materials there is no limit to the growth of our foreign trade. This will more than compensate the home producers of raw material, who, tariff or no tariff, control all the interior of the country from any apprehended loss of markets anywhere along the seaboard. Its incalculable advantage to labor is apparent. In every great line of manufactures we can produce in six months to nine months enough for our home market. "We can get rid of our surplus only by foreign trade. As long as we have taxes on the materials of industry, we cannot build up that trade, hence the other alternative, trusts, to keep down production to the home market. The workingman can see whether his interests are with a system that represses production and robs him of employment, or with a system that gives natural and healthy play to production and emancipates him from trusts and like combinations of capital.

"As to the details of the bill, I will briefly recapitulate the salient changes of the several schedules. In the chemistry schedule we have transferred to the free list quite a number of articles used in manufacturing, the most important of which is sulphuric acid, one of the commodities of all chemical industries. The duty on castor oil is reduced from 85 to 35c. per gallon. And the duty on linseed oil, which was revised to 35c. by the Conference Committee of the McKinley bill after each house had openly voted for a lower duty, we put at 15c. a gallon, pig lead being reduced from 2 to 1c. a lb. Lead paints are conspicuously reduced. The McKinley bill increased the duty on opium prepared for smoking to \$12 a lb., in the vain hope of lessening its importation. The Custom House officers on the Pacific Coast declare that this increase of duty has simply placed it in the hands of smugglers, the bringing of opium to the demoralization of the custom service, and the loss of over half a million revenue. The duty proposed is believed to be collectible and will put the traffic under government control and supervision.

"In the pottery schedule, reductions are made. Plain white ware is decreased from the high schedule in which it mysteriously crowded itself. Decorated ware is reduced from 60 to 45%; undecorated from 55 to 45%. In common window glass where close combinations have kept up the prices to consumers, under the scale of duties averaging 100%, a reduction of more than one-half has been made in all the larger sizes. There is no doubt that these rates will permit a very healthy growth of the industry here. In plate glass, reductions are made, the largest size from 50c. to 30c. per square foot, on silvered from 60 to 35c.

"In the iron and steel schedule we begin with free ore. The discovery of the immense deposits of Bessemer ores in the lake regions and of foundry ores in Alabama has rapidly swept us to the leadership of the world in the production of iron and steel and brought near at hand an undisputed supremacy in the great field of manufacturers. The use of steam-shovels reduces the cost of mining to a point where the wages paid 'natural labor' are irrelevant. Pig iron we reduce from \$6.72 per ton, which is from 50 to 90%, to a uniform duty of 22%, a rate somewhat higher in proportion than the rest of the schedule, because of cheap freight rates on foreign pig, it being a favorite freight on westward voyages. Steel rails were reduced from \$13.44 per ton, now 75%, to 25%, as the pool which has kept up prices so many years in this country seems now disorganized. The other producers will soon need protection more against Mr. Carnegie at Pittsburg and Mr. Stirling at Chicago than against foreign producers.

"The residue of the schedule varies from 25 to 30%. Beams and girders are 35%, because of the waste of cutting beams and the variety of lengths and also of the frequent necessity of changing the rolls in making beams and girders, because of the irregular quantities and lengths and sizes of orders. Tin plates are reduced to 40%, a little more than one-half of the McKinley rate. This is a revenue duty, and at the same time enough to permit any existing mills to live and flourish. Cheaper grades of pocket cutlery are 35%, higher grades 45%. Table cutlery is put at 35%. There are very substantial reductions from present rates which being specific reach in some grades of pocket cutlery as high as 90%, but with release of taxes on raw material, especially on pearl and ivory for handles, seem ample. Both copper ores and pig copper are made free, we being large exporters of the latter and the duty serving only to enable the producer to sell higher to our people than to foreigners. Nickel is free. Lead ore has a small duty of 15%, pig lead 1c. a lb. Silver lead ores are restored to the free list. Unmanufactured lumber is free. Manufactured is put at 25%, with the proviso that in any export duties or charges on foreign lumber it shall be admitted only at the rates now existing.

"Live animals are put at 20%. Barley is reduced from 30c. per bushel to 20%, which is about 12c. Breadstuffs of which we are immense exporters, are made free, except when imported from countries putting duties on our like products, in which case it is 20%. Fresh vegetables, fruits, eggs and like food products are untaxed for the benefit of our own consumers, largely the working people of the cities. Salt in bulk is free; in packages the salt is free, but the covering dutiable at rates prescribed for like articles.

"In cotton manufactures, substantial reductions are made, especially on cheap cloths and prints, and the existing system of taxing by count of thread in the square inch is retained. Hemp and flax are made free; dressed line of hemp and flax, 1c. and 1½c. respectively. Burlaps and cotton and grain and bagging are put at 15%, but when imported for covering of articles to be exported, are duty free.

"Wool is made free . . . The duty on cut diamonds, pearls and other precious stones is increased. Works of art are, I am delighted to say, put back on the free list.

"The above is a rapid summary of the chief changes made by the

proposed bill and will give a satisfactory idea, I believe, of its general structure. It is estimated that it will reduce revenues on the basis of the importations of 1892 about \$5,000,000. Something more on the basis of 1892 with an immensely larger decrease of tax burdens to the American people. The administrative law is repeated with a few amendments, suggested by experience of its operation. That law was chiefly prepared by Mr. Hewitt when he was in Congress, and the changes proposed in our bill are to make it more effective, while at the same time softening some of the features added by the McKinley bill, that would treat the business of importing as an outlawry not entitled to the protection of the government."

DETERMINING THE DIP AND STRIKE OF A VEIN OR STRATUM.

Written for the Engineering and Mining Journal by Prof. Olin H. Landreth.

It frequently occurs that the exposure of a vein or stratum is so restricted as to prevent an accurate direct determination of the dip and strike, though isolated points on the vein may be accessible at outcrop points, shafts or pits. The following methods of determining the dip and strike from such accessible points, though employing only well known principles of projection and trigonometry, may be of use to persons who may not have formulated the several steps.

The methods require that three points, not in the same straight line, shall be accessible on the vein, which is assumed to be a plane and correctly represented by the three points, as A, C and D, in Fig. 1, which represents a plan of the portion of the vein covered by the points. Fig. 2 is an elevation, and Fig. 3 a section on the line OD.

Take levels on the three points, A, C and D, and determine the bearings and lengths of the lines, AC, CD and DA, either directly or, if inaccessible, then indirectly, from a survey of the lines ABCDEFA.

The dip and strike may then be found by either of the following two methods:

Graphical Method.—Plat the survey as in Fig. 1, and also construct a vertical projection or "elevation" of the three points as in A'C'D', Fig. 2, on a vertical plane as G. L., chosen parallel approximately to the supposed direction of the line of strike. If the dip is small, the vertical co-ordinates of the three points should be platted to an

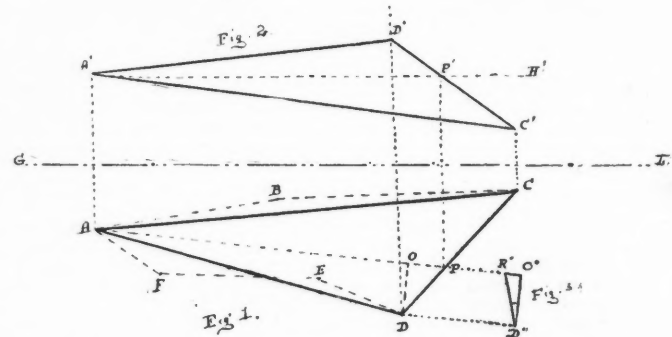


FIG. 1.—PLAN. FIG. 2.—ELEVATION. FIG. 3.—SECTION ON LINE O D.

exaggerated scale, as in profile work. Through the point whose elevation is intermediate between the highest and the lowest points, draw in the vertical projection, a horizontal line, as A'H', and mark the point P', where this line cuts the opposite side C'D'. This line is parallel to GL. From P' drop a projection line to the plan CD, of the line intersected, cutting it at P. AP is the line of the strike and its bearing may be scaled off the plat with a protractor. Any perpendicular as DO to this line AP will be the line or direction of the dip, and its angular value may be found by laying off in Fig. 3 D'O' = DO and O'R' = the elevation of D above A. O'D'R' is the angle of dip and may be scaled off with a protractor.

Analytical Method.—1. To find the line of strike through the point A, let el. A = the elevation of the point A above datum; let el. C = the elevation of the point C above datum; let el. D = the elevation of the point D above datum; then DP : DC :: (el. D—el. A) : (el. D—el. C).

$$\text{or } DP = DC \frac{(\text{el. D—el. A})}{(\text{el. D—el. C})}$$

with the two sides AD and DP of the triangle ADP, and the included angle we may compute by trigonometry the angle PAD, thus :

$$\frac{1}{2} (DPA + DAP) = 90^\circ - \frac{1}{2} (ADP)$$

$$\frac{1}{2} (DPA - DAP) = \frac{AD - PD}{AD + PD} \cot. \frac{1}{2} (ADP).$$

The half sum of the two angles DPA and DAP plus their half difference equals the greater angle; and their half sum minus their half difference equals the smaller angle, or PAD. Changing the bearing of AD by the amount of PAD to the left, gives the bearing of AP or the line of strike through A.

2. To find the direction and amount of the dip: DO perpendicular to AP is the line of dip, and its bearing may be found by changing the bearing of AP by 90° to the left.

The angle of the dip = O'D'R' [Fig. 3].

$$\tan O'D'R' = \frac{O'R'}{O'D'} = \frac{(\text{el. D—el. A})}{OD}$$

The numerator of this term is given by the levels as explained in the graphical method; the denominator OD = DP cos. ODP, in which DP has already been computed, and ODP is the difference of the known bearings of the two lines DP and DO.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Supreme Court of Iowa.

Validity of Mortgage on Mining Property.

A mortgage on certain mining property, covering the land, the coal in the land, the mining machinery and income, issues and profits arising out of the property and its business operations, is valid. Debts owing to the coal company for coal mined on the land are income and profits arising from its business operations. Such debts are the property of the mortgagees, as against judgment debtors of the mortgagor.—Funk vs. Mercantile Trust Company. 56 N. W. Rep., 496.

Supreme Court of Pennsylvania.

Measure of Damages for Deposit of Refuse in Stream.

Where a coal mining company placed large quantities of refuse in a stream, which descended upon adjoining land, and lodged there, the owner was entitled to recover damage sustained thereby, though the refuse was deposited in the stream, to make room for a retaining wall, to prevent the main bulk of the refuse, from being washed down on the land of the owners below. In such case, the measure of damages is the difference between the rental value of the land caused by the descent of the refuse upon it. Where the refuse was deposited in the stream, where every flood as well as the ordinary current would carry it gradually downstream, the fact that an extraordinary flood quickened its descent, and gave the final impulse which lodged it on his land, does not take away the liability of the company.—Elder v. Lykens Valley Coal Company. 27 At. Rep., 545.

Stipulation in Mining Lease with Regard to Royalty.

Where the parties to a coal mining lease stipulating for a specified royalty per ton, miners' weight, have for years interpreted the term "miner's weight" as meaning a ton of prepared coal, after eliminating therefrom all bone, slate, and material not marketable as coal, it is too late for the lessors to demand an accounting based upon the weight of the material as brought out of the mine. The lease excepted from its operation its upper vein, and stipulated for a minimum yearly rental of \$500. Subsequently the lessee assigned the lease to a corporation, and the lessors then leased to such corporation the right to take coal from the upper vein, reserving a royalty of 10 cents per ton, miners' weight. Thereafter, all the coal mined was taken from the upper vein and none was taken from the lower vein. The lessees were not relieved from the payment of the royalty of 10 cents per ton for coal mined from the upper vein, by the payment of the \$500 minimum royalty reserved in the lease of the lower vein, on the theory that the two leases had been merged into one by a subsequent agreement between the parties, giving the lessees the right to transport the coal through the lessors' land and deposit culm upon it, but which expressly provided that the original leases, and all the provisions thereof, should remain in full force and effect.—Drake vs. Lacey. 27 At. Rep., 539.

On Characterizing Portland Cement.—R. Fresenius and W. Fresenius assign the following limits for the properties of Portland cement: 1. Specific gravity, not ignited, at least 3.00. 2. Specific gravity, ignited, at least 3.12. 3. Loss on ignition, at most 3.4. 4. Alkalinity of aqueous solution of 0.5 cement, not more than 7.2 c. c. of decinormal acid. 5. Consumption of permanganate for 1 gm. cement, not more than 2.8 m. g. 6. Proportion of magnesia, not above 3 per cent.

Liquid Chlorine.—Liquid chlorine is now being prepared on a large scale in Europe for use in chemical work. The gas is liquified by a special form of pump, and is kept and transported in iron or steel cylinders, which themselves weigh about 100 kilograms and hold 50 kilograms of liquid chlorine, equivalent to about 15,000 litres of chlorine gas. The density of the liquid chlorine is about 1.33; at 15° C. its pressure is 6 kilograms; at 35° C. it is 10 atmospheres. The cylinders are tested for more than 100 atmospheres.

Soldering Aluminum.—By means of the alloys mentioned below, aluminum or other metals, such as iron, tin-plate, zinc, copper, brass, nickel, it is said, can be rapidly and easily soldered, either with the brazing iron or blow pipe. Aluminum can also be soldered to any of the above metals; the material is cheaper than any hitherto employed, gives a solid joint, and does not injure the metal by oxidation or otherwise: (1) Unalloyed pure tin, melting point 250°; (2) tin 1,000, lead 50, melting point 280° to 300°; (3) tin 1,000, zinc 50, melting point 280° to 320°; (4) tin 1,000, copper 10 to 15, melting point 350° to 450°; (5) tin 1,000, nickel 10 to 15, melting point 350° to 450°; (6) tin 900, copper 100, bismuth 2 to 3, melting point 350° to 450°. The first three do not color aluminum, and can be used for ornamental and artistic objects. Four and five are yellowish in color, but have the advantage of higher melting point and greater strength and hardness, and suggest the possibility of using aluminum for various articles and purposes for which hammered, coated, or enameled iron, tin-plate, copper, zinc, lead, etc., are now used. The "Journal" of the Society of Chemical Industry says, the last alloy can be made to assume any tint of yellow by varying the proportion of copper, and is therefore suitable for soldering aluminum bronzes; the proportion of bismuth is adjusted so as to keep the melting point suitable for the use of the brazing iron.

Solidified Petroleum.—The method of making fuel bricks of crude petroleum adopted by Engineer Mastracci, of the Italian Navy, is given as follows by the "Revue Scientifique": The bricks are of similar form and size to the coal briquettes extensively used in France and Germany. The mixture is made in the proportion of 1 liter of petroleum, 10% of rosin, 150 grams of powdered soap and 333 grams of caustic soda. The mixture is heated and stirred at the

same time; solidification begins in about 10 minutes, and the operation must then be carefully watched. If there is a tendency to remain liquid, a little more soda is added. The mixture is stirred until the mass becomes nearly solid. The thick paste is then poured into the molds, which are placed for 10 or 15 minutes in a drying stove. The briquettes are then cooled and are ready for use in a few hours.

Signor Mastracci recommends the addition of 20% of wood saw-dust and 20% of clay or sand, which will make the briquettes cheaper and more solid. In trials made at Marseilles on several tug-boats the petroleum briquettes furnished about three times as much heat as coal briquettes of the same size. They were burned in the ordinary boiler furnace, without any special preparation, and gave out very little smoke, leaving also little or no ash. The advantages claimed for the petroleum briquettes for marine use are the absence of smoke and a large reduction in bulk of fuel which must be carried, as compared with coal, while the risks attending the carrying of liquid fuel are avoided.

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 NOVEMBER 18TH, 1893.

- 19,411 of 1892. Production of Ultramarine. R. W. E. Macivor & A. Cruickshank, London.
- 22,023 of 1892. Liquid Nitrobenzol Explosives. A. Kramer, London.
- 23,531 of 1892. Purification of Iron and Steel. E. H. Saniter, Wigan.
- 23,616 of 1892. Caustic Soda Manufacture. F. H. Gossage & J. Williamson, Widnes.
- 23,733 of 1892. Electrolytic Soda and Bleach. E. T. Parker, Wolverhampton.
- 3,786 of 1893. Miners' Safety Lamps. J. Prestwich, Manchester.
- 5,819 of 1893. Making Bleach from Spent Liquors of Soda Ash, etc. H. Cosnett, B. J. Benson, S. Hayes & P. Smallwood, Macclesfield.
- 7,964 of 1893. Miners' Picks. W. Owen, London, and W. K. Birkinshaw, Derby.
- 17,054 of 1893. Obtaining Salt by the Refrigeration of Brine. C. D. Able, London (C. Hirzel, Winterthur, Switzerland).

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, NOVEMBER 21ST, 1893.

- 508,921. Hydraulic Air Compressing or Exhausting Pump. Oscar Dallsch, Neisse Germany.
- 508,923. Hydrocarbon-Burner. Victor C. Dillmann, Kansas City, Mo.
- 508,950. Fire-Bar for Furnaces. August Kulbrock, Berlin, Germany.
- 508,960. Brick-Kiln. Carl Moellenhoff, Hamm, Germany.
- 508,985. Mechanical Stoker. Friedrich O. Ruppert, Chemnitz, Germany.
- 58,988. Dumping-Car. William A. Thacher, New York, N. Y.
- 509,016. Welding-Furnace. Sidney H. Percy, Chicago, Ill.
- 509,055. Salicylate of Polydimethylpyrazolan. Hermann Thoms, Berlin, Germany.
- 509,057. Method of Making White Lead. Elwyn Waller, New York, N. Y.
- 509,058. Method of Concentrating Ores. Elwyn Waller and Charles A. Sniffen, New York, N. Y.
- 509,059. Manufacture of White Lead. Elwyn Waller, New York, and Bertrand C. Hinman, Brooklyn, N. Y.
- 509,142. Concentrating Blower. Fred P. Smith, Worcester, Assignor to the Smith Heating and Ventilating Company, Boston, Mass.
- 509,174. Apparatus for Carbureting Gas. Robert S. Lawrence, London, England, Assignor to Pauline Lawrence Siegrist, Boston, Mass.
- 509,205. Apparatus for Liquifying Gas. Francis B. Deane, Lynchburg, Va.
- 509,220. Hydraulic Air Compressor. John Gustafson, Brooklyn, N. Y., Assignor of one-third to Daniel Rollins Brown, same place.
- 509,251. Conveyor. David J. Sheldrick, Columbus, O., Assignor to Joseph A. Jeffrey, same place.
- 509,255. Gas Engine. Clark Sintz, Springfield, O.
- 509,265. Hydraulic Bending Press. Ralph A. Tweddell, London, and James Platt and John Fielding, Gloucester, England.
- 509,266, 509,267, 509,268, 509,269, 509,270, 509,271, 509,272. Storage Battery. Edward P. Usher, Grafton, Mass., Assignor to the Hopedale Electric Company, of West Virginia.
- 509,289. Apparatus for the Separation of Gold from Ores Containing It. William D. Bohm, London, England.
- 509,318. Steam Boiler. Henry A. Laughlin, Pittsburg, Pa.
- 509,336. Fume Arrester. Frank Swiontkowsky, Denver, Colo.
- 509,348. Thermostatic Damper Regulator. Ira F. Beers and Frederic C. Beers, Elmira, N. Y.

DIVIDENDS PAID BY MINING COMPANIES DURING NOVEMBER, 1893.

NAME OF COMPANY.	Paid in Nov.	Paid since Jan. 1st.	NAME OF COMPANY.	Paid in Nov.	Paid since Jan. 1st.
Alaska Tr'd'w'l, Alaska	.....	\$275,000	Kennedy, Cal.	.....	\$350,000
American Turquoise	.....	60,000	Mador of Erin, Colo.	.....	150,000
Aspen, Col.	.....	20,000	Mayflower Gravel, Cal.	\$10,000	110,000
Bald Butte	\$5,000	42,500	Minnesota Iron, Minn.	.....	420,000
Belden Mica, N. H.	5,000	55,000	Mollie Gibson, Colo.	50,000	1,180,000
Bimetallie, Mont.	.....	200,000	Morning Star D., Cal.	4,800	67,200
Calumet & Hecla, Mich.	.....	1,000,000	Mt. Diablo, Nev.	35,000	30,000
Centennial-Eureka, Utah	15,000	172,500	Mercur, Utah	25,000	50,000
Champion, Cal.	3,400	37,400	Napa Cons., Cal.	.....	70,000
Cleopatra	37,500	412,500	North Star, Cal.	.....	100,000
Colorado Central, Colo.	.....	27,500	Omaha, Cal.	3,600	39,600
Colorado Fuel Co., Colo. and Cons. New York, Nev.	.....	67,120	Osceola, Mich.	.....	50,000
Copper Queen, Ariz.	50,000	300,000	Pacific Coast Borax	.....	15,000
Daily, Utah	.....	187,500	Parrott, Mont.	18,000	198,000
De Lamar, Idaho	.....	450,000	Pharmacist, Colo.	.....	84,000
Dexter, Nev.	.....	115,000	Pumas, Eureka, Cal.	.....	52,734
Elkhorn, Mont.	.....	175,000	Quincy, Mich.	.....	300,000
Enterprise, Colo.	.....	175,000	Red Cloud, Idaho	.....	10,000
Golden Reward, S. Dak.	5,000	55,000	Rico-Aspen, Colo.	.....	25,000
Great Western Quick-silver, Cal.	12,500	137,500	Sierra Butte, Cal.	.....	30,628
Hecla Cons., Mont.	15,000	175,000	Standard, Cal.	.....	20,000
Homestake, S. Dak.	12,500	1-7,500	Tamarack, Mich.	.....	200,000
Hope, Mont.	.....	175,000	Trinity River Hydraul. Co., Colo.	2,500	25,000
Horn Silver, Utah	.....	187,500	Utah, Utah	.....	5,000
Idaho, Cal.	.....	65,650	Victor	15,000	105,000
Iron Mountain, Mont.	15,000	90,000	W. Y. O. D., Cal.	3,000	33,000
			Total	337,800	8,528,419

Readers of the "Engineering and Mining Journal" will confer a favor on the publishers if they will notify the "Journal" of any errors or omissions in the above table.

PERSONALS.

Mr. S. E. Gifford, mining engineer of New York, recently visited Butte, Mont.

Mr. Benjamin Micou has been appointed chief clerk of the Navy Department in place of the late John W. Hogg.

Mr. C. F. Batterman, mining engineer, of Aspen, Colo., has recently been in Butte, Mont., on professional business.

Mr. Theo. Voorhees has been appointed general manager of the Lehigh Valley Railroad and will have his office in Philadelphia.

The report that Mr. E. P. Wilbur would resign the presidency of the Lehigh Valley Railroad Company is contradicted by authority.

Mr. Wm. P. Blake, who has recently been inspecting some of the Cripple Creek gold mines, Colorado, has returned to Shullsburg, Wis.

Mr. W. C. Jemison has resigned his position as president of the Tuscaloosa Coal, Iron and Land Company. His successor is Mr. F. S. Moody.

Mr. John Yelland, well known in mining circles in Nevada, departed from Salt Lake City, Utah, recently, for a four-months' pleasure trip to Europe.

Mr. John J. Absalom, recently with the Kingston Coal Company, in Pennsylvania, is now superintendent of the Mount Carbon Coal Company, at Powelton, W. Va.

Mr. E. Renshaw Bush, mining engineer, has recently been examining some nickel properties in the Sudbury district, Ont., in the interest of Messrs. Ricketts & Banks, of New York.

Dr. Robert Bell, assistant director of the Canadian Geological Survey, has just returned from a long season's exploration on the north shore of Georgian Bay from Spanish River westward.

Mr. F. N. Drake has been appointed manager of the Wentworth Gold Fields Proprietary Company, the Amana Gold Mining Company and the Aladdin's Lamp Gold Mining Company. His address is at Lucknow, New South Wales.

Mr. Richard H. Terhune, who had held for 13 years the position of superintendent of the Hanauer Smelting Works at Salt Lake City, Utah, was obliged by the condition of his health to retire from active professional work, and on September 1st resigned his position. We are glad to learn that Mr. Terhune's health is now completely restored, although he has not as yet accepted any new engagement.

OBITUARY.

Louis S. Delaplaine, who was interested in many industries in Wheeling, W. Va., died at that city on November 27th, aged 78 years.

Samuel Gay, State Coal Mine Inspector, of Pottsville district, for the past 18 years, died in Pottsville, Pa., on November 30th, aged 55 years.

Addison Smith, who died in New York November 27th, aged 78 years, was formerly interested in the iron business in New Haven, Conn., but retired some years ago.

Charles O'Neill, for many years a representative in Congress from Philadelphia, died in that city November 25th. Since the death of Mr. Randall, Mr. O'Neill has been the senior member of the House of Representatives.

T. W. Embleton, who died November 8th, at his residence near Leeds, England, aged 85 years, was one of the oldest mining engineers in Great Britain. He was for several years president of the Midland Institute of Mining Engineers, and wrote many papers for that and other technical associations.

Geo. M. Rose, who died in Chicago, November 12th, was at one time assistant to Dr. Siemens, the famous metallurgist. He came to America some years ago, and was for a time connected with the steel works at Joliet, Ill., but for six years past has been in business at St. Paul, Minn., as mining engineer.

Robert K. Martin died suddenly in Baltimore, November 24th, aged 58 years. He was for 36 years connected with the Baltimore Water Department and had been chief engineer for a number of years. The new Gunpowder Waterworks, including the seven-mile tunnel, were designed and built under his direction.

SOCIETIES AND TECHNICAL SCHOOLS.

Technical Society of the Pacific Coast.—At the regular meeting December 1st, in San Francisco, Mr. Geo. W. Dickie read a paper entitled: "Impressions of a Mechanical Engineer at the World's Columbian Exposition."

Geological Society of America.—The sixth annual meeting will be held in Boston, beginning on Wednesday, December 27th. The local committee have selected the Thorndike as headquarters, and

special rates will be given to visiting members. Titles and abstracts of papers to be presented at the meeting should be presented at once to H. L. Fairchild, secretary, at Rochester, N. Y., as the intention is to issue the list of papers for the meeting by December 12th.

Engineers Club of Philadelphia.—At the regular meeting, November 18th, notice was received of the death, in Ecuador, of Mr. Thomas M. Cleeman, a member and past president of the Club. A committee was appointed to prepare a suitable memorial. A general discussion was had on the question of the pressures required for machine riveting in bridge and boiler work. A number of members joined in this and the discussion was continued until the next meeting. A paper by Mr. Pierre Giron, on the "Grinding of Portland Cement," was read and discussed. A chart was presented showing the result of tests on the deflection of trolley poles.

Civil Engineers' Club of Cleveland.—At the regular meeting, November 14th, the tellers announced the election to active membership of Wm. C. Jewett, A. Lincoln Hyde, Frank H. Constant, John G. Schmitt and Henry Grey. Letters were read from the German Engineering Society and from the American Society of Engineers and Architects, acknowledging courtesies extended at Chicago in connection with the World's Fair, and extending thanks for the same. A letter was read announcing the election of Prof. J. B. Johnson, as president of the Association of Engineering Societies, and John C. Trautwine, as secretary of the same body. The president appointed Mr. C. W. Foote a member of the programme committee to succeed Mr. Uebelacker, resigned. Mr. W. H. Searless then presented a paper on the "Ferris Wheel," which was discussed by Prof. J. W. Langley, C. F. Lewis, W. R. Warner, Geo. E. Gifford, Ambrose Swasey, F. C. Osborn, A. H. Porter and N. P. Bowler.

INDUSTRIAL NOTES.

The Stirling Company reports that the boilers on exhibition at Chicago, 2,800 H. P. in all, have been sold.

Van Alen & Co. have put their rolling mill and nail factory, at Northumberland, Pa., on double time. Puddlers and helpers have agreed to work on a \$3 scale.

The Donaldson Iron Company, pipe manufacturers, at Emaus, Pa., announces a reduction of 10% in wages, affecting all men except laborers, who get 90 cents a day.

Natural gas has been struck near Charleston, W. Va., and will be piped to that city. The Kanawha Salt Works will reopen, and 500 men will be started to work at once.

The Reading Iron Company has announced a reduction of from 5 to 7½% in the wages of its 750 employees of the rolling mill and the tube mill, beginning December 1st.

The Newport Rolling Mill Company's works, at Newport, Ky., were stopped November 29th, by a strike against a 10% reduction in wages. About 500 men were thrown out of work.

The Berlin Iron Bridge Company is putting up a roof on the power house of the State street horse railroad at New Haven, Conn. The building is 84 x 250 ft., the roof trusses and the roof of slate.

The Carbon Steel Company, Pittsburg, is now the largest producer in this country of acid open-hearth steel, for boiler, ship and bridge plates, and similar purposes. The company has furnished large amounts of steel plates for the ships of the navy, and has also supplied steel for a number of boilers for naval vessels.

The Troy Iron and Steel Company's property at Troy and Albany, N. Y., are offered for sale by the receivers. The plant consists of the rolling mill, known as the Albany Iron Works, the rolling mill and hammer shop at Troy, known as the Rensselaer Iron Works, and the three blast furnaces on Breaker Island. Bids must be sent to the receivers on or before December 12th, and will be open on that day. The sale must be approved by the court.

According to a Washington dispatch Attorney-General Olney has rendered an opinion that certain notes issued by corporations at the time of the recent currency "famine" are now taxable 10% under the bank circulation law. In the course of his opinion, which is addressed to Secretary Carlisle, he says: "Comparing the statute in question with the other statutes referred to in Hollister Mercantile Institution (111 U. S.), it evidently applies only to the case of a promissory note, and does not cover other negotiable paper or quasi negotiable paper. For the Revised Statutes in force when the act of 1875 was passed provided for a tax upon bank circulation, including as circulation all certificates, checks, and all notes and other obligations calculated or intended to circulate or to be used as money, and they made it unlawful to make, issue, circulate, or pay out any note, check, memorandum, token, or other obliga-

tion for a less sum than \$1, intended to circulate as money or to be received or used in lieu of lawful money of the United States. Mr. Olney holds that none of the instruments submitted to him is of a nature to subject it to taxation.

MACHINERY AND SUPPLIES WANTED.

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

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

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

GENERAL MINING NEWS.

ALABAMA.

Tallapoosa County.

(From our Traveling Correspondent.)

I have recently had an opportunity of examining a portion of the gold fields in this county, where very extensive work was carried on as long ago as from 1835 to 1845 in quartz mining. Again about 12 years since considerable work was performed, and several "pounding" mills, as they were called, of limited capacity, were in operation. But water and sulphurets were the causes of suspension of work at both periods. Recently the belt extending northeasterly from the old Bonner-Terrell mine, situated about two miles south of Jackson's Gap, on the Central Railroad of Georgia, has been attracting some attention. The portion of that belt which I examined lies in the vicinity of the New Yorker shoals, and on both the east and west sides of the Tallapoosa River. The belt really crosses the river at the shoals, which extend for a distance of two miles. I followed the outcrop of this belt from a point four miles northeast from the shoals to the Bonner-Terrell mine, about 12 miles in a southwesterly course. One of the most noticeable features of this district, which has received the name of the Eagle Creek mining district, is the bold outcrop along the parallel ridges which comprise the belt. On one hill, 1½ miles northeast from the shoals, the quartz, which forms the veinstone, outcrops at many points along the lead in large boulders, pieces from which prospected by panning. This quartz is of a sugary nature and considerably decomposed. The ore body, where the solid formation was exposed in some old workings, has the characteristics of a segregated vein banded by clay, evidently the secondary condition of the mica schist, in which formation it occurs. The same quartz occurs in the ore bodies on the western side of the river and the lead sustains its continuity throughout the entire distance to the Bonner-Terrell mine, but becomes somewhat harder and less porous and decomposed. On the western side of the river a lead of hard flinty quartz, highly sulphureted, but prospecting satisfactorily in free gold, occurs paralleling the sugary on the southeast at a distance of several hundred yards, and extends, so far as at present known, for a distance of three miles. At one point on this lead, about 1½ miles from the river, several openings were made about 12 years since, and considerable of the ore milled until work was suspended because of water and a greater percentage of sulphurets. For a distance of about five miles along the first-mentioned lead, and three miles along the second, the old shafts and tunnels are encountered at irregular intervals. Samples showed by panning that this sugary quartz averaged very evenly. I examined all where the conditions admitted, and found that the ore bodies possessed the same characteristics as to formation as in that one particularly referred to; but in none of these did it appear that the ore had been worked out. Of course, no estimate as to permanency or extent could be made because no systematic mining had been carried on. Usually an incline shaft had been sunk on the vein to a depth of 10 or 15 ft., or a short tunnel cross-cutting the ore body had been run and the ore taken out from the outcrop down. When that depth was reached work had been suspended. The dip of these veins is from 30° to almost vertical. In traveling in a southwesterly course along to ridge, known as the Devil's Backbone, these old workings became scarcer, until at a distance of about five miles northeast from Jackson's Gap, they ceased altogether, but the outcrop sustained its continuity. At the Gap the railroad company has excavated a cut about 25 ft. deep which cross-cuts the formation and affords an excellent opportunity to study the same. Several seams of quartz bedded between the slates are exposed, following the serpentine contortions, into which many of the seams of slate have been twisted and folded, but irregular in thickness; some being of considerable thickness at the outcrop and pinching out as depth is reached; and others having no outcrop exposed on the surface, occur a greater or less distance down, and widening out at the bottom of the cut to several feet, in fact, one which I measured at the extreme eastern end of the out-

showed 5 ft. in thickness at the bottom, with no outcrop exposed on the surface. Samples taken from some of these veins failed to show free gold from panning, but yielded a good showing of sulphurets.

Parallel to this lead of gold-bearing quartz from the point where I saw its most northern outcrop, four miles east of the river, and about a quarter of a mile to the north, occurs strata of graphite, which at one point measured about 15 ft. across, where a cut had been made for a public wagon road. This is paralleled by what is termed the corundum belt, and this by a belt carrying asbestos and mica. Work is being performed at one point on the western side of the river to develop the asbestos and mica; and some time since considerable activity in mining the corundum was manifested but remoteness from railroad facilities for transportation and limited demand caused suspension of work. These are of undetermined extent. On the east side of the river the gold belt is bounded on the south by a series of immense granite dikes, which have apparently been forced up between the strata of slates, and have a course parallel to the belt. To the north of this exposure of the granite, about eight miles, occurs another exposure of considerable extent, and apparently lying parallel to the first. At Flat Rock, about 16 miles northeasterly from the New Yorker shoals, many blocks of this granite have been cut for millstones, which are still in use in the grist mills in this section. A syndicate of capitalists has recently bonded about 1,000 acres of mineral land in the immediate vicinity of the New Yorker shoals, on both sides of the river, and proposes in the spring to commence active operations in mining, and treating the gold-bearing ore by chlorination. Within the boundaries of this tract are contained nearly all the old workings on the gold belt, which have been prospected, and the ore assayed by the agent for the syndicate during the past summer.

At the old Bonner-Terrell mine the workings are in such a caved and unsafe condition that no examination could be made; but on the southwestern extension of that lead I found a thin vein of very high grade ore, but of a pockety or kidney formation, so far as it has been opened. To the southward, about 450 ft., and with its strike parallel to this thin vein, another occurs of greater extent, so far as thickness is concerned, but of a low grade. A shallow cross-cut on the thickest of these veins is the extent of the work performed; while on the thin vein an incline open cut following the strike of the vein for about 30 ft. in length, and 6 ft. in depth, comprises the development.

ARIZONA.

Maricopa County.

Phoenix Consolidated Gold Mining Company.—According to the Phoenix "Herald" President Alley, of this company, has secured control of the Meshacerty and Columbia mines, adjoining the Phoenix property and will develop them fully before turning them over to the company. The Meshacerty is an extension of the Phoenix, and has been developed sufficiently to show a big vein. The Phoenix mine is turning out lots of ore and when the mill is ready there will be hundreds of tons on the dump to keep the stamps going incessantly. The work on that property is being done on levels and drifts and shows a large deposit of ore. The mill is fast nearing completion and it is now expected that the 100 stamps will begin dropping about December 1st.

Yuma County.

Harqua Hala Gold Mining Company.—This company's return for October shows 2,755 tons of ore crushed during the month. The value of the gold produced was \$30,500, and the total expenses \$10,100, leaving an estimated profit of \$20,400 for the month.

ARKANSAS.

Marion County.

At a recent meeting of miners on the Eldorado district, a petition was sent to the Secretary of the Interior asking for the withdrawal of homestead privileges and the setting apart of mineral lands of the district.

At present the operation of the mines is held back by want of transportation facilities. The ore is shipped down White River to Batesville, and thence by railroad. It is hoped, however, that a railroad line will soon reach the mine.

Lion Hill Mountain.—At this place, two miles above Buffalo City, the head of the steamboat navigation on White River, an outcropping of zinc ore 1 ft. thick was found. A drift run into the hillside shows a vein $4\frac{1}{2}$ ft. wide at 31 ft. and 5 ft. wide at 47 ft. from the surface, the average being about a 30% ore by assay. At this place a boiler house and blacksmith shop have been built and also a boarding house for the workmen. The drift was started in about 200 ft. above the level of the valley, and the ore is sent down to the crusher by a gravity chute.

Morning Star Mining Company.—At the Chicago Exposition much attention was attracted by the mass of zinc ore displayed by this company in front of the State Building, both on account of the size of the mass and the freedom of the ore from foreign substances. The company is now, it is stated, turning out one ton of ore per day for each man employed in the mine, and it is also stated

that its expenses are much lower than those of the mines in the Joplin district, as the ore is mined by open drift into the mountain side, and no hoisting or pumping is required.

CALIFORNIA.

Amador County.

Wildman.—At this mine the sinking of the incline is progressing rapidly. The management is now enlarging the shaft preparatory to making the station at the 1,200 level, which will be reached next week. Sinking will be continued from that point down to the 1,300 level. The shaft is being sunk in the gauge between the footwall and the main ledge, in which there has been no break from the 1,100 level. Slabs occasionally broken from the ledge show good indication.

Butte County.

Banner.—Major McLaughlin has bought from W. E. Phillips and the Hazard Mining Company the property locally known as the Banner quartz mill and mine. This property Major McLaughlin has sold to the Development Syndicate, Limited, of London. The mines include the Banner, Banner extension, Amosky and the Clark & Coffee ledges. In an early day the top ground of the Banner ledge was worked and proved rich. The shaft is now down 500 ft. and it is reported that fine rock has been struck in the lower levels.

The following items of Butte County mining news are from the Oroville "Register": Within the past few years the developments in this county have been marked and extensive. At Forbestown three are now three quartz mills with eight stamps and a fourth mill is being built which will give 10 more stamps. At Oregon City within the past year two mills have been built and one is now in operation and the other will be in a short time. At Hurlston a new mill has been built within a year and two other mines have been developed so extensively that mills will be erected. There has been a new mill built by D. K. Perkins at the summit of the mountains, near Gravel Range, while the mining developments about Bangor have been great, and 100 men are now employed where two years ago not 10 found work. A new mill was erected this season at Nimshen. It is thought that the quartz mill on the Banner mine will soon be started. There have been more ledges opened and more mines developed in Butte within the past two years than during the six years that preceded 1892.

Calaveras County.

(From our Special Correspondent.)

Utica Mine, Angel's Camp.—The October yield amounted to \$182,000, and as the cost of operating the mine and the 100-stamp mill is only \$40,000 a month there remains a handsome sum to be divided.

Kern County.

(From our Special Correspondent.)

Big Blue Mine, Kernville.—This group of mines is generally regarded as containing low-grade ore in large quantities. It is reported that Senator Jones and J. B. Haggin are heading a syndicate to reopen the property and carry on work on a large scale.

Mono County.

(From our Special Correspondent.)

Bulwer Consolidated Mining Company, Bodie.—Ore is being stoped out in north and south stopes from winze, 1,200 level. On Tuesday the Bodie mill commenced crushing Bulwer ore.

Standard Consolidated Mining Company, Bodie.—The mill is now running on half time. In order to keep it running continuously it has been necessary to work some lower grade ore than would yield profitable returns. The idea at present is to work a higher grade of ore with a reduced force.

Nevada County.

(From our Special Correspondent.)

Mistletoe Mine.—This property is a comparatively recent prospect, but the outlook is very satisfactory. Eastern parties have offered \$20,000 for it and the deal in all probability will be closed.

Placer County.

(From our Special Correspondent.)

Mayflower Gravel Mining Company, Forrest Hill.—A shipment of bullion valued at \$6,500 has been received at the San Francisco office.

San Francisco County.

(From our Special Correspondent.)

A consignment of 1,000 flasks of quicksilver was shipped to Hong Kong by the steamer sailing this week. The consignment is worth \$40 per flask and this is the first shipment of this kind made to Hong Kong for three years. These supplies have in the last year or two been furnished by London, England having been underselling California in China.

Washington Mining Company.—J. G. Morrison has sued E. J. Moore, executor for H. A. Pearson, deceased, for an accounting of his mining transactions with deceased. It is set forth in the complaint filed that on August 18th, 1886, Morrison & Pearson entered into partnership in Idaho mining business under the above company name. The partnership continued until Pearson's death in 1889. Pearson purchased an undivided half interest in several mining claims owned by Morrison for \$30,000, paying two-thirds down, and it was understood that he should retain the profits coming to

Pearson until the balance should be paid up. To date there has been expended in their mining operations \$129,920, the amount received from bullion sales, mining supplies, etc., \$92,122, showing a deficit of \$47,797, of which sum Morrison paid \$23,996 and Pearson \$14,742, leaving a sum of \$9,106 still claimed by Morrison in addition to the original balance of purchase money. To recover these amounts the present suit has been brought.

Siskiyou County.

(From our Special Correspondent.)

Mayflower Gold Quartz Mining Company.—W. S. Kerr, a director and agent of this company, was arrested early this week on a charge of embezzling funds belonging to the corporation. H. M. Binckley, treasurer of the company, swore out the warrant.

COLORADO.

Clear Creek County.

Mayflower Mining Company.—At Denver, on November 23d, Judge Hallett, of the United States Circuit Court, made an order of sale of the Mayflower, Lafayette, Michael D. Graff placer, and all tools and machinery belonging thereto, in the Spanish Bar district, to satisfy a mortgage of \$45,000. This is the outcome of a suit brought by Sara R. Barbour, against Wm. D. Renshaw, A. H. Koren, the Mayflower Mining and Milling Company, Dingwall Brothers, Henry Plummer & Co., and others. The defendants confessed the debt, in accordance with which the marshal was ordered to sell the property at the public auction.

El Paso County.

Lily vs. Victor.—R. H. Dill and others began a suit in the District Court at Colorado Springs November 22d, against Robert Davis and others. The complaint alleges that on September 8th, 1891, the plaintiffs filed on certain land in Cripple Creek and located the Lily mining claim; that on May 7th, 1892, while in peaceful possession of the property, the defendants entered and took forcible possession of the same and have established thereon what is now known as the Victor mine. Plaintiffs pray that they may be reinstated and awarded damages, and that a temporary injunction be issued to prevent the defendants from moving any further ore from the mine.

Lottie Gibson Mining Company.—The Lottie claim, owned by this company, it is stated, has been leased and bonded by H. Collbran for a year.

Garfield County.

Consolidated.—The miners in this mine, at New Castle, have returned to work, the safety lamps being retained. The reduction to \$4 per yard is made, and \$2.75 instead of \$3 per day will be paid for inside work.

Gunnison County.

Du Boise District.—The latest gold camp is that known as Du Boise, on Goose Creek, a branch of the Cebolla, and located about 20 miles southwest of the town of Gunnison. The camp is not easy of access at present. It is said that between 400 and 500 claims have been located. According to the Denver "News" the ore is found in a fissure vein. The vein is in the form of trachyte braccia with metamorphic granite very close to it. In some locations the fissure is metamorphic granite. Not many mill runs have been attempted and the fire tests which have been made are not a safe indication of the value of the ore. The gold belt is said to extend northeast and southwest, and is at an elevation of about 8,000 ft. The ore carries copper and iron, the main veins being crossed by numerous fissures that extend an unknown distance in each direction. Lake City is about 25 miles to the south. The nearest known gold deposit is 25 miles to the northeast, beyond Gunnison. The region is entirely new.

Goose Creek.—These gold fields, situated near Gunnison, are reported to show favorable prospects, but very little development work will be done until spring.

Lake County.

Commercial Gold and Silver Mining Company.—The following changes and alterations in the articles of incorporation have been filed: First, to amend the articles of incorporation by stating that the stock is non-assessable. Second, to permit meetings of the stockholders to be held beyond the limits of the State of Colorado, in Boston. Third, to elect the following board of six directors, to hold until the next annual election: Halsey J. Boardman, S. M. Carleton, E. H. Brigham, T. H. Lord, J. W. Dumphy and William Haskins. Article 3 of the articles of incorporation was changed to make capital stock read \$50,000 and be in 5,000 shares. Operations will be carried on in Lake and Custer counties, and the principal office to be located in Leadville.

(From our Special Correspondent.)

The Morning and Evening Star.—These mines are shipping steadily. The iron bodies are practically inexhaustible, and, as there has always been a good market for this stuff, the lessees are keeping steadily at work.

Eli vs. Clipper Mining Company.—A suit was filed November 27th in the district clerk's office by the Eli Mining and Land Company vs. the Clipper Mining Company. The complaint sets out that on December 14th, 1877, John Leahy, Thos. Starr, George Young, A. Balrige, F. H. Edwards and

J. B. Hall located certain placer workings in California Gulch. On or about November 25th, 1890, the defendants, it is alleged, entered upon a portion of the land and the Eli company now asks damages.

Mountain Lion.—Some gold ore is being taken from this property by lessees.

R. A. M.—The Marian people, on the R. A. M. shaft, November 25th, at a depth of 960 ft. in their new shaft, encountered the first indications of mineral. The porphyry is decomposed and heavily iron stained. The management believes that they have struck the cap of the regular ore chute.

Shamrock.—Active work has again been started by lessees on this lode and this week they began breaking good looking carbonate ore.

The Smelters.—The smelter situation is still in a very unsettled condition. There are two questions which seriously affect these people; first, the wage question, and, second, the ore supply. The Bi-Metallic has three stacks in blast, while the Elgin runs one furnace. There is still some uncertainty about the Arkansas Valley plant starting up, and your correspondent hearing so many rumors visited the plant to-day and learned that repairs were being made and ore was being purchased, but that it would probably be several weeks yet before a start would be made.

Wolcott.—Shipments on this property have ceased until air connections can be made. The new shaft is down 260 ft. in iron and lake bed material. The intention is to drift from the new shaft to the old workings.

Larimer County.

Blue Bird Copper Mining Company.—This company has been organized with a capital of \$300,000, to operate in Larimer County. Directors: J. E. Hume, J. R. Todd, C. E. Hale, L. Hale, W. C. Derby, B. F. Burnett and T. C. Rainey.

Ouray County.

Ouray Mining and Milling Company.—In the suit for a receiver entered by the Hendrie & Bolthoff Manufacturing Company, of Denver, vs. this company, H. W. Hibbard, George H. Smith, H. A. Sherrill, Edward Price, Thomas D. Price, W. J. Chamberlain and Frank Dillingham, composing the firm of W. J. Chamberlain & Co., are made party defendants in the suit. The plaintiff alleges that many thousand dollars are due numerous creditors, and that confusion detrimental to the interest of the plaintiff is feared. Besides a receiver, they ask that all the defendants be restrained from assigning any stock; that they be restrained from assigning a certain contract with Pankhurst & Schroeder, and that W. J. Chamberlain be prevented from paying the Ouray Mining and Milling Company any money due the company. A full accounting is asked.

Park County.

Press dispatches announce the discovery of gold near Hartsell, and say that many men are going to the new fields, principally from Cripple Creek. No details have been received, however.

FLORIDA.

Marion County.

Standard Phosphate Mining and Chemical Company.—This company owns 220 acres of land near Kendrick, and is mining soft phosphate on about 120 acres. The washing plant can handle 20 tons daily, and the grinding plant 60 tons. The headquarters of the company are at Alexandria, Va., and a large part of the shipments are made to that State.

Polk County.

Florida Mining and Chemical Company.—This company has filed articles of incorporation to mine and work phosphates and to prepare them to market. The capital stock is \$200,000, and the officers are: W. S. Warner, Bartow, Fla., president; Warren Tyler, Bartow, Fla., treasurer; Geo. A. LeMaistra, Wilmington, Del., secretary. The company will have offices at Bartow and at Tampa.

GEORGIA.

Polk County.

North Georgia Mineral Land Company.—This company, whose office is at Cedartown, has made an arrangement to send a car north and west to bring Georgia ores to the attention of consumers. The car is well appointed and contains numerous samples of minerals of the Piedmont section of Georgia, including clays, ochers, bauxite, pyrites, manganese, gold, etc. The car will be sent over a circuit of about 6,500 miles, going west as far as Omaha, north as far as St. Paul, and thence east, stopping at many intermediate points, to New York City, whence it will be returned to Atlanta. The object is to obtain orders for raw material for shipment. The car will be in charge of Mr. J. E. Land, president of the company, and Geo. H. Clark, secretary and engineer.

White County.

Glover Mine.—On this mine, which is under the charge of Capt. W. H. McAfee, the main tunnel, which was run in at water level, is now in 130 ft., and for nearly all that distance has followed the vein which yields from \$10 to \$12 per ton in free gold. Higher up the hill another tunnel was started on an outcropping, but this was found after a short distance to connect with the lower vein.

Recently a third opening was run in farther up the hill, and last week this tunnel struck a vein about 18 in. wide showing very well in gold. The vein dips at an angle of about 35° and will be followed up as far as possible.

IDAHO.

Alturas County.

Poorman Mines.—Considerable development work is being done on this mine, according to the Wallace "Miner." The lowest or eighth level is being pushed each way from the shaft, and is now about 160 ft. long. A new pump shaft is being put down and work on this is driven from the second, fourth and sixth levels. A new air compressor, made by Fraser & Chalmers of Chicago, is being put in. It has a capacity to run 20 drills, and takes the place of the old one which supplied 12 drills only.

Star.—Favorable reports come from this mine, located near Hailey, and regular shipments are being made to the Pueblo smelters.

Coeur d'Alenes.

Standard Mining Company.—This company is now taking out about 80 tons of ore a day, which is sent to the Union mill for concentration. Most of this ore comes from the Standard tunnel, which is now 1,500 ft. long. A sorting house has been built at the mouth of the tunnel, from which a gravity road 1,750 ft. long runs to the ore bins adjoining the railroad. The Standard tunnel is the central one of three at this mine. The upper tunnel, known as the Wilson, is in 450 ft., but has not yet reached the vein.

Tiger Mine.—No work is in progress at this mine but the concentrator has been started upon ore that has accumulated from development work; only 12 men are employed.

Lemhi County.

Columbia Consolidated Gold Mining Company.—This company has been organized to carry on operations in Lemhi County, Idaho; capital, \$1,000,000; directors: C. E. Hawkins, C. Ellis, Jno. McDonough, H. S. Howe and G. F. Ross-Lewin.

Oneida County.

Clear Lake Mining and Irrigating Company.—This company, it is reported, has been organized by Ogdin parties, who have purchased some valuable placer land on the Snake River, near American Falls. The tract is said to cover about 960 acres. It is the intention of the investors to construct a large ditch from a lake near by to the placer grounds and also to irrigate 10,000 acres of fertile government land, which has just been thrown open for settlement. The placer ground is near the Bonanza mine.

Owyhee County.

Anchor & Host Opal Mines.—These claims are being worked steadily and a number of stones of good quality are being taken out. The mines are on a block and are developed by open cuts and tunnels; the opals are found in veins and the ground requires blasting. Great care has to be exercised to avoid breaking or injuring this stone in taking it out.

Snake River Placers.—The Silver City "Avalanche" reports that a number of miners, who have been working along the Snake River this season, have met with fair success but no important strikes have been made. Much interest is felt in the trial of new machinery near Parma. The gold found along the river is generally very light and difficult to save.

Shoshone County.

The American Placer Mining Company.—This company has filed articles of incorporation. The capital stock is \$500,000. The directors for the first year are R. K. Neil, George P. White, Horace C. King, James M. Porter and Angus Sutherland. The office is at Wallace.

ILLINOIS.

Macoupin County.

Girard Coal Company.—This company, which operates coal mines at Girard and Chatham, has made application for the appointment of a receiver to wind up its affairs. This action results directly from the failure of the American Casualty Company, which will compel the coal company to meet a large number of judgments obtained by its employees for damages received in an accident which happened two years ago. The Casualty Company had insured the coal company against accidents, but its failure leaves the judgment standing against the property.

McLean County.

McLean County Coal Company.—The teamsters and surface men of this company struck November 28th, on account of a reduction in wages of 10%. The miners did not strike, but were compelled to stop work because no coal could be moved. It is thought that a compromise will be made.

INDIANA.

Hancock County.

Gibbs Farm.—On November 25th a gas well, which was being drilled at this place, near Greenfield, got beyond control, the tools and the derrick being driven out with violence. The flow of gas is very strong, and has not yet been brought under control.

KANSAS.

Lyon County.

Keystone Coal and Construction Company.—This company has been organized at Emporia, with \$1,000,000 capital stock, to mine coal and do other construction work. J. B. Glaze, D. P. Moran, W. E. McGinness, J. W. Page and others are the incorporators.

MICHIGAN.

Iron—Marquette Range.

Buffalo Mine.—No orders have as yet been received for starting up work, but the mine has been pumped out and everything has been made ready.

Cleveland Cliffs Iron Company.—At this company's Salisbury mine the new engine, boiler and pumping house are nearly completed. The new building will contain all the hoisting and pumping machinery. Foundation for the pumping engine has been put in and the engine will shortly be ready.

Escanaba River Iron and Land Company.—This company resumed work on its new shaft at Swanzy December 1st.

Lake Superior Iron Company.—This company, according to the Norway "Current," will put about 100 men at work on its Section 16 mine early in December. At Section 21 mine drifts are being run from both shafts and the headings are about 700 ft. apart both in ore.

Penn Iron Mining Company.—This company has paid its men the balance due for September and October and will, it is stated, pay regularly hereafter. The company has a force of 475 men which is somewhat less than half its full force. A reduction in wages of 16% goes into effect December 1st.

Iron—Menominee Range.

Pewabic Mining Company.—A fire started in the timbering on this mine November 27th. The extent of the fire is not yet known, but it was necessary to shut down the shaft and stop work until it could be extinguished.

MONTANA.

Cascade County.

Belt Coal and Coke Company.—At this mine 20 men are now employed and the main tunnel has been driven in 850 ft.

Livingston Coal and Coke Company.—At this mine 250 tons of coal per day are being taken out, and about 150 men are employed, 70 of them under ground and 80 upon the surface and at the coke oven.

Rocky Fork Coal Mine.—This mine is producing at present 400 tons of coal per day, or about one-fourth of its full capacity.

Timberline Coal Mine.—About 100 men are now employed at this mine, 65 of them under ground, and the output is about 400 tons daily.

Deer Lodge County.

Puritan Mining Company.—The recent discovery of ore on the 400-ft. level has given this company a considerable reserve, and arrangements have been made to start up the Algonquin mill at Hasmark, on Puritan ore.

Missoula County.

Charcoal Mine.—This mine is making regular shipments of ore of a good grade, and the mine is said to be in a promising condition.

Chicamain Mine.—The eight-stamp mill at this mine is running steadily and the yield from the ore is understood to be from \$8 to \$12 per ton, which will give a fair profit on the cost of working. As soon as the ditch is completed the mill will be run by water power and the cost of working decreased.

Curlwe Mining Company.—This company has a force of 30 men at work and is doing considerable development work on the 500-ft. level. The stamp mill and concentrator are running steadily.

Iron Mountain Mining Company.—This company is now employing a full force of men and running its concentrator. The company has decided to keep at work through the winter and to sell the concentrates at the best market rates.

Keystone Mining Company.—This mine is now being worked by Wm. Bryan under a lease. He has 19 men employed, and recently shipped three carloads of ore. This is a silver mine and carries ore of a fair grade.

Landowner Mine.—A force of men are now working this mine under contract. The ore now exposed is free milling quartz, carrying a fair amount of gold.

Nine-Mile Mining Company.—This company is now running steadily and employing about 60 men.

San Martina Mining Company.—At a special meeting of the trustees held in Missoula November 1st, a certificate was prepared showing that at a special meeting of the stockholders, the stock had been made assessable in accordance with the law of Montana to the extent of 2 cents per share. The secretary was authorized to advertise delinquent stock for sale. With the funds raised by assessment it is proposed to continue development work through the winter upon the company's Little Giant and Smuggler. The company also intends to build a 10-stamp mill early in the spring.

Silver Bow County.

Alice.—The Alice mill, at Waterville, was started up again last week and will soon be employing a full force.

Boston & Montana Mining Company.—This company has been compelled to lay off a part of its force temporarily, owing to the caving in of the Wickes tunnel on the Northern Pacific Railroad, which stops the shipment of the ore to the smelter at Great Falls until the road is repaired. The company has been running both mine and smelter in full force and the delay will cause considerable loss.

Butte & Philadelphia Mining Company.—This company has levied an assessment of 1/2 mill per share; it is payable at the treasurer's office, in Butte, December 20th, and will be delinquent after that date.

Volunteer Mining Company.—This company has levied an assessment of 1 cent per share, payable at the office at Butte, December 15th, after which date it will be delinquent.

(From our Special Correspondent.)

Black Rock.—Some work is still being done here in the black ore on the 100 level. Three or four hundred tons of low-grade rock are being hoisted a month. The motion for a new trial in the case of the Niagara against the Black Rock (Fitzgerald et al. vs. W. A. Clark et al.) is set for argument on December 2d.

Estella.—The suit of J. A. Murray vs. F. A. Heinze, concerning the value and mining of certain ores from this claim, is to come up next week. The principal witness for the defense will be C. F. Batterman, well known as expert for the Speculator, in the Bell-Speculator case, and for the Niagara, in the Niagara-Black Rock case.

Never Sweat.—Two men were severely injured by a premature blast in an open cut on the 24th inst., the cause being careless handling of a drill they were using as a tamping stick. The Never Sweat belongs to the Auaconda company immediately adjoining it.

Parrot Company.—The principal mines of this company started up on November 22d and as soon as sufficient ore accumulates the smelter will do so too. At present there are about 60 men on a shift in the Parrot mine proper, and 12 men on a shift in the Moscow. With the resumption of work on the former mine, the whole Parrot lead, from the original Butte & Caledonia on the west end, to the Ramsdell Parrot on the east, is in operation.

NEVADA.

Churchill County.

National Nickel Company.—According to the local newspapers this company, whose mine is located 40 miles southeast of Lovelocks, is about to commence the construction of reduction works at that point. It is reported that the company's mine shaft has been sunk 550 ft., several tunnels run at various points on the ledge, and other development work done. Works will be erected to separate the nickel from the arsenic and cobalt, and it will then be shipped to the Shelby Smelting Works, at San Francisco, for further refinement.

Lander County.

Austin Mining and Milling Company.—According to the local papers the mines near Austin are looking well and are milling and shipping large quantities of high-class ore. The company is making some big improvements, among them being a tunnel 6,000 ft. long, which is being driven to develop new country. It has already cut several veins of high grade ore and the prospects for other strikes are said to be good.

Storey County—Comstock Lode.

Crown Point Mining Company.—The latest weekly official letter says: The south drift from the 700 level stope is now out 34 ft. The face is all quartz, car samples from which run from \$3 to \$8 per ton. The proportion of gold remains the same. A portion of the week was devoted to timbering. We are still engaged on repairs to the shaft.

Justice Mining Company.—The latest weekly official letter says: The Blain tunnel is now out a total distance of 173 ft. The face is in hard porphyry and low grade quartz.

(From our Special Correspondent.)

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

Mines.	Ore Hoist'd	Car Sample Assay.	Ore Milled.	Av. Batry Assay.	Bullion for Week.	Total.
Hale & Norcross	41	34.87	.....	.....	.....	.....
Occidental	113	18.96	.....	.....	.....	.....
Potosi.....	10	39	.....	.....	.....	.....
Savage....	170	16.55	150	\$20.20	.....	.....
	2443	25.08	280	23.76	\$3,566.64	.....

123 Cars.

Segregated Belcher & Midas Mining Company.—The latest weekly official letter says: The connection between the 1,200-ft. level raise and the lateral drift on the 1,100-ft. level has been completed, and explorations south and north on the

quartz encountered in the raise will be started at once. We are running north on the ore exposed in the south raise, 1,100 level. It varies in width from 1 to 3 ft., of fair quality. Assays run from \$18 to \$30 per ton.

NEW MEXICO.

The placer fields of New Mexico, it is reported, are experiencing extraordinary activity. This is so even in camps where scarcity of water and flour gold make it impracticable to adopt the ordinary sluicing process. At Dolores, the excitement over the discovery of a new streak of placer gravel that yields \$5 to \$20 per day per man continues, and many new prospectors are arriving in that camp. On the Chama River the last six carloads of machinery for the Bucyrus amalgamator plant has reached there and is rapidly being placed in position. Along the Hondo gravel beds, in Taos County, there is much activity, despite the lateness of the season, and, on the whole, the enterprises pertaining to placer gold mining are going on with the most encouraging outlook.

Grant County.

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

Bell & Stephens, of Pinos Altos, shipped 83 oz. of gold last week.

Bell & Stephens' mill.—This mill is running on Pacific and Ohio ores. They have out more ore than they can conveniently handle.

Brockman.—This mine, at Lone Mountain, has 400 tons of ore on the dumps. The mill will start up this week.

Deep Down.—The cyanide process introduced at the Deep Down mine was not a success. The mine and mill have been closed down temporarily in consequence. Pan amalgamation will take the place of the cyanide process.

Kept Woman.—This mine is lying idle on account of scarcity of mill power.

Mammoth.—This mill is running steadily on Campo Santo ore with good results.

Ohio.—D. P. Carr is working on the Ohio, one of the Bell & Stephens' properties.

Pacific.—A contract for running drifts 455 ft. has been let on the Pacific extension. One drift will be 255 ft. north, and the other 200 ft. south.

Pyramid Mining and Milling Company.—Pyramid is quiet, owing to a lawsuit among the stockholders of this company. The company's mill is running steadily but not much bullion is being shipped. Only a few men are being employed.

Robert E. Lee.—Owing to the depreciation in silver, this mine, at Pyramid, has suspended operations for the present.

Texas.—Eleven tons of ore from the Texas mine, in Central district, recently shipped to Socorro, with silver at 70 cents, brought over \$1,900.

NEW YORK.

Ulster County.

Bigelow Bluestone Company.—The property of this company, at Malden, was sold under a mortgage foreclosure of \$137,000, in Kingston last week. It was purchased by J. Taylor Harris, of New York, president of the Ulster Bluestone Company, for \$100,000. The property, which was sold for the benefit of mortgage bondholders, is one of the most valuable bluestone properties in the State.

OREGON.

Baker County.

Emma Mine.—Ore from this mine is now being worked at the Grayson mill, in Baker City, with good results.

White Pigeon.—P. R. Bishop has begun suit against S. B. Baisley to recover damages and to enjoin the defendant from further working this claim. Plaintiff alleges that he located and owns the claim, but that defendant had begun to work it and to take out ore without his permission.

Josephine County.

An extensive hydraulic mine is being opened up near Wolf Creek. A ditch 15 miles long is being built from Grove Creek to the placers to carry 5,000 in. of water. There are 250 men employed and seven miles have been completed to date. The work is under the charge of Mr. Wm. Huntley Hampton, mining engineer, of Portland.

Union County.

Friday Mining Company.—This company has been organized by L. Simmons, James Raymond, J. W. Kennedy, and others, to develop gold mines recently discovered about 30 miles southwest of Union. The company expects to go to work at once.

PENNSYLVANIA.

Allegheny County.

Carnegie Gas Company.—This company has made a location for a test well about four miles southwest of Murrysville in new territory. The company has just completed a new vein extending from the Milltown field across the Kiskiminitas River to the gas development near Keyport.

Philadelphia Company.—This company is putting down a gas well on the McAllister farm, near Monroeville, in territory that has not hitherto been tested.

Anthracite Coal.

Four more Lehigh collieries between Shamokin and Quakake resumed operations on November 28th.

All the mines of the Hillside Coal Company and of the Erie Railroad north of Scranton began operations on full time on November 27th.

Delaware, Lackawanna & Western Railroad Company.—This company's Bellevue colliery, at Scranton, was forced into idleness on November 27th by a surface squeeze that affects 27 chambers in the Diamond vein, and so shattered the air passages that work in other portions of the mine would be very dangerous to the workmen. The company will at once repair the damage, as every mine is being worked to its full output, on account of the good demand for coal.

Pennsylvania Coal Company.—The erection of new chutes at No. 7 shaft of this company, at Pittston, which caused a suspension of hoisting coal for several weeks, is nearly completed and operations are expected to begin by next week. The hoisting of coal at No. 11 shaft will also begin about then. The company has made several improvements at the latter colliery.

Philadelphia & Reading Coal and Iron Company.—This company's net earnings for October were \$358,358. This is the largest net earning for any month in the company's history, and is \$47,342 in excess of the net earnings of last October, although the ruling prices of coal at that time were from 10 to 15 cents per ton higher. The company's collieries produced in October, 1893, 860,928 tons of coal, which tonnage was only exceeded in October, 1891, when the production was 878,864 tons.

Wyoming Valley Coal Company.—This company has leased its Harry E. and Forty-Fort collieries to Simpson & Watkins, of Scranton, Pa. The new firm will put in machinery and develop these mines which have never been worked to their full capacity.

Bituminous Coal.

The miners of the Beech Creek and Clearfield coal regions have been notified of a 10% reduction, to go into effect on December 1st, to be followed into the Clearfield region on the 11th.

Rockhill Iron and Coal Company.—This company early in the week notified its miners at the Robertsdale colliery, in the East Broad Top region, that work would be suspended indefinitely at all the collieries on December 1st. About 300 men and boys are thrown out of employment. The company's furnaces at Rockhill were blown out indefinitely about three months ago.

Washington County.

South Penn Oil Company.—This company's well on the Hall farm south of Mannington has passed through Gordon sand and failed to show any signs of oil. It is probable that no further work will be done in that section.

SOUTH DAKOTA.

Lawrence County.

Equitable Mining Company.—Work was commenced recently on a tunnel for development purposes on the White Pine lode, which is one of the claims owned by this company. A few feet from the surface an ore chute, 12 ft. wide, was uncovered and cross-cut. This is the first discovery of the lower contact in that section of Nevada Gulch.

Pennington County.

The Hill City "Tin Miner" publishes the following items:

Caribou.—This group, a mile south of the Keystone, has been worked almost continuously this summer exposing a large body of ore.

J. R. Mill.—This mill has been running with only a portion of the 10 stamps, but the miners will have plenty to do to supply them and the company is not in a hurry. The vein in the bottom of the shaft is said to look well.

Keystone Mill.—This mill is dropping all the stamps the supply of water will allow, generally 15, and is taking sufficient gold off the plates to pay expenses while new ore bodies are being opened up. The foreman of the mine says there are now in the lower level 4 ft. of good ore, part of which is rich in free gold. A larger pump is being put in which, it is hoped, will increase the available water supply for the stamps from the lower level. But 10 stamps have been in use during the past few days.

TENNESSEE.

Claiborne County.

Mingo Mountain Coal and Coke Company.—About 350 miners at this company's mines, at Cumberland Gap, struck on November 27th, because they did not receive their wages. The company says the men must go back at reduced wages, if at all. The miners say they will not go back, and that all the miners in that section will go out if matters are not satisfactorily adjusted.

Roane County.

Brushy Mountains.—The appointment of receivers for the East Tennessee Land Company will not, it is said, effect the sale of the Brushy Mountain coal property to the State of Tennessee, and the arrangements for the transfer of the property and the opening of the mines will be continued. The completion of the branch railroad to the mines will also be carried on without delay.

UTAH.

Juab County.

Bullion-Beck Tunnel Company.—This company has been organized with a capital stock of \$500,000, divided into 500,000 shares, of the value of \$1 each. Its incorporators are local capitalists. Such Lake City is the principal place of business. The object of the company is to engage in and carry on a general mining and milling work, locate, purchase and sell mines, and mill, smelt, purchase and sell ores. The capital stock of \$500,000 is fully paid up and is represented by mines and claims in the Tintic mining district, among them being the Mammoth tunnel site, Protection lode, Big Eastern and East Boy. The officers are: Henry Dinwoodey, president; A. E. Hyde, vice-president; Frank Y. Taylor, secretary; and L. G. Hardy, treasurer. These, with John Beck, George Romney and Jesse W. Fox, Jr., constitute the board of directors.

Salt Lake County.

Shipments of ore and bullion from Salt Lake City for the week ending November 18th amounted to 1,021,213 lbs. of bullion and 1,590,290 lbs. of silver and lead ores.

The receipts of ore and bullion in Salt Lake City for the week ending November 22d were \$140,514, of which \$89,664 was in bullion and \$50,850 was in ore. The receipts for the previous week were \$164,701, of which \$117,051 was in bullion and \$47,650 was in ore. The receipts of Mingo bullion during the week were \$33,624; Hanauer bullion, \$19,850; base bullion, \$35,450; bullion, \$740. Ore receipts during the week were \$33,000 by McCormick & Co. and \$17,850 by T. R. Jones & Co.

Summit County.

Anchor Mining Company.—The annual election of this company was held in Park City last week and the following directors were elected: Francis Smith, E. J. Holmes, J. M. Adams, H. E. Myers, S. C. Tewksbury, F. A. Nims, David Keith, Richard Mackintosh and D. C. McLaughlin.

Tooele County.

Camp Floyd District.—Encouraging reports continue to come from this district. The Mercur mine, accounts of which we have published in this journal at various times, is the largest property yet developed there. Recently some Colorado capitalists, including Senator Edward O. Wolcott, purchased the Golden Gate group, consisting of seven claims. A force of men are now at work developing the property. A cyanide mill will be erected to treat the ore as at the Mercur. Five other companies have begun operations in the district.

Glencoe.—This group, owned by E. J. Raddatz and F. Durgy, comprises a large number of claims. Through the property runs a large ledge of gold ore, lying in many places only a foot under the surface, and at various points laid bare for many feet by trenches. On this vein in various places tunnels are being run and shafts sunk and every shift's work adds to the bodies of milling ore now in sight. The company proposes soon to commence the construction of a mill with power sufficient to reduce 150 tons a day, but with a tank capacity for the present of 50 only.

WYOMING.

Albany County.

A new vein of coal has been discovered at Lewis, 19 miles east of Laramie. The vein is said to be of good width and fair quality, and preparations are being made to develop and explore the deposit.

Gold Hill Placers.—Many men are reported to be going into these placers with the view of working through the winter as far as possible.

FOREIGN MINING NEWS.

CHINA.

In a report to the Foreign Office, just issued, Mr. W. Beauchamp, of the British Legation at Peking, states that "a large amount of gold comes to Peking as dust from the washings on the Chinese side of the Amoor River and partly smuggled across the Russian frontier; it is melted down in Peking into the shape of small bars of 10 taels weight, about the size of a sponge-cake finger biscuit, and has nominally a percentage of 98½ pure gold." He adds that "in Peking there must be a large amount of hoarded gold, for the officials, who in many cases make large fortunes out of their places, buy gold bars and secrete them, fearing to put their money into banks, because their superiors would discover its existence and confiscate the whole of it. . . . When silver is very cheap, and gold correspondingly dear, the possessors of these hoards of gold realize their property, and buy in again on the recurrence of a low market."

GREAT BRITAIN.

Scotland.

Advices from Glasgow state that the strike of the Scotch coal miners continues. The masters refused to accede to the demands of the men and consequently several manufacturers in expectation of a long struggle closed their mills on November 27th. The price of coal has risen 25%.

NOVA SCOTIA.

Marlow Gold Mining Company.—This company is preparing to put up a five-stamp mill on its property at Central Rawdon. The mill made at the Windsor foundry. A new process is to be tried at

this mill which is a modification of the chlorination process.

Nova Scotia Gold Mines, Limited.—This company reports for the month of October 80 oz. of gold from its workings at Montague. For three months previously the returns had been low, owing to a barren streak, but the October reports show a great improvement.

ONTARIO.

Algoona Nickel Mines.

(From an Occasional Correspondent.)

A syndicate with headquarters in Duluth, Minn., is opening up a nickel property in Trill, with a view of introducing the Emoneus or Gossan process of treating nickel ores. Other Duluth parties are exploiting gold properties in the Wahnapiata section.

The most important nickel discovery of the season has been made in the township of Snider, only 3½ miles from the Copper Cliff mine. The mineral outcrop is traceable for three-quarters of a mile on the surface, and the ore is high grade.

From Rat Portage in the west to the Ottawa River in the east, the new mining law enacted two years ago by the Ontario legislature, putting a royalty on ores, is universally condemned by the mining community, and a more liberal mining policy will be urged upon the Ontario Parliament at the coming session.

Worthington.—Work has been resumed on this mine, and considerable improvements are being made in the surface plant.

Chicago Nickel Company.—This company has gone into liquidation, owing, it is said, to the financial stringency in the United States, where the working capital came from. This company began operations, some three years ago, on what is known as the Traverse Mine, in the township of Drury, under lease from the owners. A very good smelting plant has been erected on the property, and the mine is considered one of the best on the range.

Work on all the other nickel mines here is likely to be carried on all winter as usual, if not on a larger scale in some cases. It is rather difficult to find out the intentions or plans of any of the companies here, but more explosives have been ordered by the most of them this fall than in any previous year.

SOUTH AFRICA.

Transvaal.

New Primrose Gold Mining Company.—At the recent annual meeting in Johannesburg the directors reported, for the year ending June 30th, total receipts of £240,597. Working expenses of all kinds amounted to £171,041, leaving a profit for the year of £69,556; from this three dividends of 7½% each were paid, and a further dividend of 20% has been paid since the close of the year. The total output of gold from the mines was 71,409 oz., of which 49,953 oz. were saved in the battery, and 21,456 oz. by the Cyanide plant. There were 121,480 tons of ore crushed. The average cost per ton for working was: For labor, \$2.77; for supplies, fuel, etc., \$1.80; general and office expenses, \$0.34; total, \$4.91. The cost of labor has increased somewhat over the preceding year, owing to the demand for native labor. Developments during the year included 599 ft. of shafts, 635 ft. of winzes and 10,234 ft. of drifts and crosscuts. This makes a total of 11,468 ft. new work, the average cost of which was \$9.56 per running foot. The amount of ore in sight is estimated at about 150,000 tons. The 100-stamp mill has been working steadily, and two large Gates crushers have been added to the plant. Another 50-stamp mill has been purchased and will soon be put up. The second cyanide plant was started up in February and has treated 57,300 tons, at an average cost of \$1.16 per ton including royalty, or of 92c. excluding the royalty.

Witwatersrand.—The October statement of the mines in this district, as telegraphed from Johannesburg, gives the total production for the month at 138,599 oz. gold. For the 10 months ending October 31st the production was 1,056,794 oz. gold, against 986,433 oz. for the corresponding period in 1892, 575,531 oz. in 1891, 397,682 oz. in 1890, 296,785 oz. in 1889 and 154,510 oz. in 1888.

WEST AUSTRALIA.

The total export of gold during the September quarter was 25,262 oz., valued at \$95,997. Of this 16,217 oz. came from Yilgarn and 7,294 oz. from Murchison.

News about the Dundas Hills find, near Coolgardie, has been received says, the "Australian Mining Record." The reports are that there is alluvial gold on the south and north range, and that good returns are obtained. There is abundance of water on this field, the main dam being full and running over, and that the soaks and wells are also furnishing supplies. Water is also available on the route from Coolgardie to Dundas. Traveling is easy if proper diversions are made for water.

Coolgardie.—The latest news from these new goldfields is to the effect that many men continue to go there, but the difficulty with regard to water and supplies still remains. While a few of the miners are doing well, there is much suffering, and loss of life is feared if no rain falls soon.

Roaring Gimlet.—This district, which is some 50 miles from Coolgardie, is being gradually deserted. The surface and placer workings were not good, but some good prospects have been found for quartz mining.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Dec. 1.

Statement of shipments of anthracite coal (approximate) for week ending November 25th, 1893, compared with the corresponding period last year:

	1893.	1892.	Difference.
	Tons.	Tons.	
Wyoming region	476,314	406,174	Inc. 70,140
Lehigh region	111,568	129,856	Dec. 18,288
Schuylkill region	255,397	259,299	Dec. 3,902
Totals	843,279	795,329	Inc. 47,950

Total for year to date.. 38,962,396 37,738,978 Inc. 1,223,388

PRODUCTION OF BITUMINOUS COAL, in tons of 2,240 lbs. for week ending November 25th and year from January 1st:

	1893.		1892.
	Week.	Year.	Year.
Shipped East and North:			
Phila. & Erie R. R.	1,924	72,603	88,311
Cumberland, Md.	91,833	3,792,518	3,468,572
Barclay, Pa.	410	41,947	61,951
Broad Top, Pa.	11,573	520,226	565,685
Clearfield, Pa.	80,851	3,468,153	3,609,283
Allegheny, Pa.	25,380	1,132,665	1,159,892
Beech Creek, Pa.	38,743	2,496,372	2,048,872
Pocahontas Flat Top.	60,756	2,605,887	2,384,286
Kanawha, W. Va.	70,032	2,947,711	2,381,291
Totals	381,512	17,978,082	15,762,093

	1893.		1892.
	Week.	Year.	Year.
Shipped West:			
Pittsburg, Pa.	24,597	1,098,176	1,142,193
Westmoreland, Pa.	2,932	1,679,741	1,593,616
Monongahela, Pa.	13,564	634,311	603,190
Totals	67,093	3,412,258	3,338,999

Grand totals..... 448,605 20,490,340 19,101,092

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending November 25th, 1893, and year from January 1st, in tons of 2,000 lbs.: Week, 46,449 tons; year, 3,597,952 tons; to corresponding date in 1892, 4,872,829 tons.

Anthracite.

The anthracite coal trade during the week under review has shown no new feature of interest, and, generally speaking, we find that the same conditions prevail to-day that existed a week ago. Taking it all in all, the market is in fair condition. The cold weather of a few days ago and the Lehigh Valley strike combined to stimulate trade somewhat and the business done was rather better than was anticipated. Egg and broken have been and are still very dull. For the other sizes the demand is fair.

The monthly meeting of the sales agents was held in Philadelphia last Tuesday. It was very wisely agreed to leave prices as they have been. It is difficult to see how an advance could have been ordered, and all the talk of some persons who "hoped" that prices would not be raised is absurd, when it is considered that the full rates named in the present schedule of prices have never been obtained; there is always more or less shading. The sales agents also deemed it wise to restrict the output this month by closing down on Monday and Tuesday of the first two weeks of the month, that is on December 4th, 5th, 11th and 12th. This, it was thought, would bring the production to about 3,000,000 tons. No fixed allotment was decided upon, but it was understood that, if the shutting down of the four days fixed upon at the meeting do not prove sufficient to keep the output within safe limits, a further reduction will be made by stopping work on some other days of the month. From all the reports we have had the meeting was harmonious, and so thorough an understanding was arrived at that it seems as though the producers had at last realized that they must act in concert. It is admitted that fair profits can be made at present prices, and the folly of cutting each other's throats by over-production and demoralized prices is more than ever apparent.

The Lehigh Valley Railroad Company seems to be winning, and, whatever the result may be, it looks as though the end were not far off. The company has had comparatively little difficulty in meeting its customers' demands for coal and the other companies have lent it a helping hand in this matter. The effect of the strike on the coal trade here has not been very great.

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	4.50	4.60	4.60
Schuylkill red ash.....	4.50	4.50	4.95	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.

The Reading Railroad reports that its coal shipment (estimated) for last week, ending November 25th, was 235,000 tons, of which 30,000 tons were sent to Port Richmond and 35,000 tons were sent to New York waters.

The New York, Lake Erie & Western Railroad reports the total tonnage of coal of all kinds passing over its lines for the year ending September 30th at 9,743,261 tons, against 10,931,728 tons for the preceding year.

NOTES OF THE WEEK.

The Philadelphia & Reading Coal and Iron Company reports for the month of October gross earnings of \$2,923,623, expenses were \$2,489,844, leaving the net earnings \$433,779. Deducting fixed charge

and improvements, there remained a surplus of \$260,837, an increase of \$38,224 over October, 1892. For the eleven months of the fiscal year to October 31st, after deducting fixed charges, there was a deficit of \$375,525. For the corresponding period of 1892 the expenses and charges exceeded the earnings by \$117,281, showing an increase in deficit of \$258,244 this year.

Bituminous.

In no wise has the condition of the soft coal market changed since the time of our last report. Our remarks of a week ago are equally pertinent to the situation to-day. The trade is in poor condition. The orders which are being received are just about sufficient to keep up the usual tonnage, and in some cases they are not enough for even that. During the week there have been in the market some orders and contracts for South American ports and Cuba. These, we are told, went to the commission men who happened to have the biggest "pull" with the parties who had the disposal of the orders. The price did not have much to do with it, as there was very little margin of profit.

Most of the consignees at shoal water ports about New York harbor, as well as up to those in the far East, have already filled up for their winter wants. Orders from those points are pretty well out of the market.

All rail business along the lines of the various railroads, which, however, is but a comparatively small portion of the trade, is still the most active branch of the market, and shipments are keeping up well.

To a great extent the trade is still being done from the upper ports and most of the shipments are going to points and places this side of Cape Cod. The car supply is good from all roads and cold weather is looked forward to as the means of bringing into the market some new spot orders.

Transportation of coal to tidewater is fairly good. Coastwise vessels are scarce, being tied up at the discharging ports waiting for cars to unload. Judging from appearances some of the vessels have gone into winter quarters.

This scarcity maintains the rates at loading ports established by the Vessel Owners' Association.

We quote ocean freight rates as follows from Philadelphia: To Boston, Salem and Wareham, \$1; Providence, New Bedford, New Haven, Bridgeport and Allyn's Point, 90c.; Portland, \$1@1.05; Portsmouth, \$1.05; Lynn, \$1.10@1.25; Newburyport, \$1.15; Bath, \$1.05@1.10. Vessels are almost impossible to get for the ice ports and fancy figures are given.

Boston.

Nov. 29.

(From our Special Correspondent.)

The action of the sales agents in confirming the old price list for the coming month was generally expected, as it seemed utter folly to institute an advance at this time when anthracite, in fact all kinds of coal, is so very quiet.

The demand for hard coal has not improved over last week, and prices remain exactly as they were. The individual operators are selling for about the same prices, so far as we hear.

The companies' prices are quoted on a net New York basis f. o. b.: Stove, \$4.45; egg, \$4; free broken, \$3.75, and chestnut, \$4.25.

Individuals' white ash coals sell as follows on the basis of the New York f. o. b. price: Stove, \$4.25; egg, \$3.85; free broken, \$3.75; chestnut, \$4.25; Lykens Valley (at Philadelphia): Broken \$4.90; egg, \$5.55; stove, \$6, and chestnut, \$5.25.

There is practically no more doing in bituminous coal than there was a week or two ago. The mills here in New England are slow to start up and for that reason are taking very little coal. The yards are as slow to purchase bituminous as they are anthracite. Cumberland coal on cars here is quoted \$3.85 per ton; New River and Pocahontas, \$3.80@ \$3.85; Clearfield, \$3.50.

Freight rates are firmly maintained at the prices quoted last week. They are: From New York, 75c.; from Philadelphia, Newport News and Norfolk, \$1; from Baltimore, \$1.10; to Sound points, 10c. less.

The retail demand for coal is of very fair proportions, as consumers are buying more toward laying in a winter stock. Prices are well maintained. Boston retail prices 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. 29.

(From our Special Correspondent.)

The anthracite coal trade without special features other than business has improved in consequence of the winter weather prevailing. Supply adequate to all requirements, notwithstanding the Lehigh strike, which the officials of the company here declare has come to an end and freight moved without trouble or delay.

Shippers of coal by lake continue to engage tonnage to Lake Huron and Michigan ports, expecting the severe weather will cease, and the vessels reach their destination before the final close of navigation. The severe storms on the lakes, which have been almost continuous for 10 days or more, have hindered the progress of vessels materially, driving them into harbors for shelter; so at all ports and places of shelter. Damages reported have been numerous, but no total losses have been announced.

The bituminous coal trade is fairly active and the quotations steady. Manufacturers stocking up for winter. Tugs and propellers are still buying coal.

Navigation on the canals of this State has been impeded by ice to some extent, but the latest news

shows that measures have been taken to get all boats to their destination.

The Lehigh Valley Coal Company will erect at an early day a 200,000 tons coal dock at Superior City.

Coke is quoted at \$3.65 for foundry and \$3.75 for crushed Connellsville per 2,000 lbs. in car lots in Buffalo on track. Reynoldsville and Tyler 40c. per ton less for foundry.

Ice over 8 in. thick has closed Duluth and Superior harbors for several days. To-day it is stated that the navigation of the Sault Ste. Marie River is very much impeded by floating ice. The Straits of Mackinaw have not yet succumbed to King Winter.

The docks and trestles at all Western lake ports are well stocked with coal.

Many of the boats chartered here lately have a "detention clause" inserted in the contract.

The final statement of the shipments of coal from this port by lake this year are expected to exceed those of 1892.

The shipments of coal westward by lake from Buffalo from November 20th to 26th, both days inclusive, aggregated 95,905 net tons, distributed as follows: 53,750 tons to Chicago; 22,500 to Milwaukee; 5,300 to Duluth; 2,500 to Superior; 1,500 to Green Bay; 5,925 to Toledo; 1,730 to Port Huron; 1,100 to Racine; 1,300 to Gladstone and 300 to Bay City. The rates of freight were 60c. to Chicago and Milwaukee; 40c. to Duluth, Superior and Gladstone; 75c. to Racine; 40c. to Washburn; 60c. to Green Bay; 35c. to Toledo, Port Huron and Bay City.

The Connoton coal dock at Cleveland was damaged to the extent of \$10,000 by fire last week.

Chicago.

Nov. 29.

(From our Special Correspondent.)

The recent publication of an article stating that the Indiana coal producers had formed a pool whereby every ton of block coal shipped to Chicago would be shipped to wholesale dealers through the Indiana Block Coal Company is now denied, the president of the Indiana Block Coal Company stating that there has been no change whatever in existing arrangements. Last spring they made contracts to purchase the output of mines in the district for one year. No new mines have been added since. There was an advance of 10c. at the mines September 1st, but miners got 7 1/2c. of it. Prices are now stationary and there is no corner.

There has been no increased demand for coal here, although we have had three days of exceedingly cold weather, but it is expected that the present nasty weather, rain and snow, will, if it is general throughout the West and Northwest, create a considerable demand within ten days or a fortnight. The common price of anthracite appears to be about 25 cents off circular prices, which are: Lehigh lump, \$6.25; large egg, \$5.85; small egg, range and chestnut, \$6.10. Retail prices per ton are: Large egg, \$6.75@ \$7; small egg, range and chestnut, \$7@ \$7.25.

Regardless of the fact that there is so much freight moving, the demand for bituminous coal is exceedingly light for engine fuel. The consumer is just taking enough to meet the demand, and for this time of the year such conditions are unusual. Resumption of work is heard from various iron mills and manufacturing plants all over the West, but the effect of such, although apparent, does not materially affect the market as yet.

Many believe that there will soon be a reaction here which may cause coal merchants a considerable inconvenience in obtaining supplies on account of transportation facilities. Prices of bituminous coal per ton of 2,000 lbs. f. o. b. Chicago are: Youghiogheny, \$3.40; Pittsburg, \$3.35; Hocking Valley, \$3.10; Brazil block, \$2.70; Illinois lump, \$2; Indiana lump, \$2.

Coke continues to show steady improvement, the numerous resumptons materially aiding.

Connellsville operators are holding firmly to \$4.40. Crushed coke is meeting with much favor here and in the Northwest. Quotations are: Connellsville foundry, \$4.40; crushed, \$4.50. West Virginia foundry, \$4.00; furnace, \$3.90. New River foundry, \$4.40. Walston furnace, \$4.10; foundry, \$4.35.

Pittsburg.

Nov. 30.

(From our Special Correspondent.)

Coal.—So far as values are concerned the market has undergone no change. The Allegheny River is rising, and the coal men are expecting sufficient water to send out light tows. Last evening the marks showed 6 ft. 9 in. If the water reaches 6 ft. several million bushels of coal will depart. Crews are engaged and provisions on board. It will be a great disappointment if the rise should fail to reach the desired point.

The wickets at Davis Island dam were lowered last night.

Latest advices are that the rise has come at last and many boats have started.

Connellsville Coke.—Shipments are increasing, but coke operators give up hope of an immediate boom in trade; of course the increase is a matter of congratulation between all parties concerned. Since our last report over 400 more idle ovens have been fired. Stocks of coke have been piled up since the slump in August, and have gradually been increasing; last week orders were of such a nature that the operators were given a chance to get rid of their surplus. The stock coke is always sold at a low figure. Last week's shipments were about 500 cars in excess of those of the previous week. The Western furnaces increased their orders, and in the Mahoning and Shenango valleys business has a bright aspect. Between now and the first of January

there will be but few of the 2,000 idle ovens fired up.

The shipments for the week aggregated 67,140 tons, distributed as follows: To Pittsburg, 1,575 cars; to points east, 930 cars; to points west, 1,225 cars; total 3,730 cars. Western shipments increased 225 cars; Eastern, 180 cars, and Pittsburg, 145; net increase 550 cars. It is reported that coke is selling below quoted rates. Present rates for various kinds are: Furnace coke, f. o. h. cars at ovens, \$1.25 per ton; foundry coke, f. o. h. cars at ovens, \$1.65 per ton; crushed coke f. o. h. 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, Dec. 1, 1893.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending				From Jan., '92	From Jan., '93.
	Dec. 2, 1892.	Dec. 1, 1893.	F'ces.	Tons.		
Anthracite.	71	31,046	35	16,440	1,589,096	1,315,441
Coke.....	136	131,405	59	60,507	6,355,409	6,112,148
Charcoal...	44	9,705	25	5,170	493,462	369,246
Totals....	251	172,156	119	82,117	8,437,967	7,796,835

Pig Iron.—In no particular has the pig iron market undergone the slightest change, either for the better or for the worse, since our last report, and the comments we made then apply equally pertinently to the market of to-day. There is a dearth of news in the trade.

During the week under review the holiday on Thursday served, of course, to make the trade more or less quiet, but even without it we do not note any signs which might lead to the belief that there is any appreciable increase in the demand for pig iron hereabouts. Dealers report that consumers are taking "their usual amounts," which means that they are still huying from hand to mouth.

Prices continue low and somewhat unsteady, but not any more so than for the past few weeks.

President Baxter, of the Tennessee Coal, Iron and Railroad Company, in a letter under date of November 28th, says: We have accepted orders for iron until our sales for delivery amount to 152,000 tons. Some two weeks ago we advanced our price 25c. per ton and have just made another advance of 25c. During the summer we have only operated six furnaces, but last week put another stack in blast at South Pittsburg, and have just given orders to put two more in blast, one at Rnsley and one at Bessemer, and to begin work on two more so as to have them ready to start up at short notice.

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@ \$21.

Bullets and Rods.—This market continues very quiet and we do not hear of any transactions worthy of mention. Quotations are nominally as follows: Domestic hillers, \$18@ \$20; foreign bullets, \$28@ \$29, tidewater. Wire rods, domestic, \$28@ \$29; foreign, \$30@ \$30, tidewater.

Manufactured Iron and Steel.—There is nothing new to report of manufactured iron and steel. We do not hear of any sales of importance and prices still rule low. We quote: Angles, 1"70@ 1"85c.; axles, scrap, 1"75@ 2c. delivered; steel, 1"75@ 2c.; hars, 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"75@ 2c. on dock; steel hoops, 1"75@ 1"9c. delivered; links and pins, 1"70@; 1"80c.; plates, flange, 2@ 2"10c.; firebox, 2"5@ 2"8c. 5 flange, 2"10@ 2"25c.; marine, 2"50@ 2"75c.; sheared, 1"81 @ 2"10c.; shell, 1"75@ 1"95c.; tank, 1"55@ 1"75c.; universa mill, 1"65@ 1"80c.; tees, 2@ 2"15c., all on dock.

Merchant Steel.—Nothing new or of interest has developed in this market since our last report. It continues quiet, and prices nominally unchanged, as follows: 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 pring, \$3.75@ \$4.

Old Material.—The market for old material continues very dull, and no business of importance is reported this week. Such quotations as are given are altogether nominal, and are not a fair criterion of the market, as it is difficult to say exactly at what price sales could be made. We quote: Old iron rails \$12@ \$13; No. 1 wrought scrap at \$9.50@ \$10, both delivered to vessels at this port. Other quotations are as follows: Old steel rails, \$8@ \$10; old wrought tubes and pipe, \$7.50@ \$8.50; wrought turnings at \$9@ \$9.25 delivered at mill.

Rail Fastenings.—There is nothing to report of rail fastenings. They are very quiet and we do not hear of any sales of consequence. Quotations are nominally: Fish and angle plates, \$15@ \$15.80 at mill; spikes, 1"80@ 1"90c.; bolts and square nuts, 2"25@ 2"45c.; hexagonal nuts, 2"45@ 2"60c., delivered.

Spiegeleisen and Ferromanganese.—There is nothing doing in either spiegel or ferro. Quotations are nominally: 10 to 12% spiegel, \$22@ \$22.50; 20%, \$25@ \$25.50; 80% ferro, \$55.50@ \$56.50.

Steel Rails.—The situation in the steel rail market continues pretty much as it was at the time of our last report. So far as actual business is concerned there is nothing to say, as there have been no sales worthy of mention. In regard to the new "combination" there are many contradictory reports. Representatives of the steel companies in question state that none of the newspaper accounts of the deal is correct. It is admitted that in the matter of prices our last week's report is true, but we understand that definite arrangements have not yet been made with the Pennsylvania Steel Company nor with the Maryland Steel Company. It is likely, however, that before very long the whole affair will be finally and definitely settled.

Tubes and Pipe.—There is nothing of interest to report of this market. It continues quiet. Ruling discounts on carload lots are as follows: Butt, black, 5 1/2%, 10 and 5%; butt, galvanized, 50, 10 and 5%; lap, black, 6 1/2%, 10 and 5%; lap, galvanized, 5 1/2%, 10 and 5%.

NOTES OF THE WEEK.

The South Mill of the Lackawanna Iron and Steel Company at Scranton, Pa., has resumed operations after a shutdown of several months. One of the mills of the company has been boarded up for the winter.

At a meeting of the stockholders and creditors of the Pennsylvania Steel Company held in Philadelphia, November 29th, it was decided to appoint a committee of seven unsecured creditors to confer with the committee of five stockholders, with the view of formulating some plan for reorganizing the property. The chairman of the meeting, C. Stuart Patterson, will select the committee and announce his appointments soon. Four of the members will be selected from the principal creditors in New York, Boston, Baltimore and Philadelphia. The meeting was harmonious and largely attended.

Buffalo. Nov. 30.
(Special Report of Rogers, Brown & Co.)

The general run of melters are not buying, and in the majority of cases are using not to exceed one-third of their normal amount of pig iron. There has been such heavy buying during the week by a few large melters that the market, especially for Southern iron, has taken on an air of firmness. Prices rule about as quoted below, though even these are shaded in some instances by inferior irons. Quotations are for cash f. o. b. cars Buffalo: No. 1 X foundry strong coke iron, Lake Superior ore, \$13.25; No. 2 X foundry strong coke iron, Lake Superior ore, \$12.75; Ohio strong softener No. 1, \$13.25; Ohio strong softener No. 2, \$12.75; 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, \$15.75; Southern soft No. 1, \$12.75; Alabama car wheel, \$16.50@17.50; Hanging Rock charcoal, \$18.50@20.

Chicago. Nov. 29.
(From our Special Correspondent.)

There is somewhat of an improved condition in the Chicago iron market, but nothing in the nature of heavy buying has as yet started up. Consumers, large and small, are now running with an increased consumption, while numerous concerns that have been idle a long time will shortly start again.

A little activity is reported in Northern coke irons, and some small buying is noted in Southern coals, but the aggregate of the latter is not large.

Taking everything into consideration, the outlook begins to brighten, yet the volume of transactions remains small. The attitude of the furnace companies, North and South, is unchanged, but a trifle more firmness is perceivable on the part of Southern manufacturers.

Pig Iron.—There is no decided improvement over previous week's report of market. Small lots continue to be the demand, carloads to a few hundred tons. Southern iron remains dull with but few sales. Quotations per gross ton f. o. b. Chicago Southern coke, foundry, No. 1, \$13.50; No. 2, \$12.10; No. 3, \$11.65; Lake Superior charcoal, \$15.50@16; Lake Superior coke No. 1, \$13.50@13.75; No. 2, \$12.25@12.75; No. 3, \$12.25@12.50; Lake Superior Bessemer, \$14; Lake Superior Scotch, \$13.75@14.25; American Scotch, \$15.50@16.00; Southern coke soft, No. 1, \$12.25; No. 2, \$11.65; Ohio silvers 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; standard Southern car wheel, \$18.25@18.75.

Structural Iron and Steel.—No sales of any importance have been made during the past week; small lots continue but these come from regular customers. 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, \$1.70@1.80; beams and channels, \$1.75@1.85.

Plates.—There is but little trade for warehouse orders or plate steel, the boiler shops continuing to work on half time and less. Inquiries from outside points have a slight shade of improvement. Prices are: sheet steel, \$2.15@2.35; tank steel, \$1.85@2.00; sheet iron or steel, \$2.25@2.50; firebox steel, \$4.00@4.50; flange steel, \$2.35@2.50.

Merchant Steel.—The general situation shows a fair volume of trade coming in for soft steels, special shapes. Quite a number of contracts have been made for present and future delivery. Tool steel continues to be inactive. Quotations are: Tool steel, 6.50@6.75c. and upward; tire

steel, 1.85@1.90c.; toe calks, 2.20@2.30c.; Bessemer machinery, 2.00@2.10c.; Bessemer bars, 1.70@1.80c.; open hearth machinery, 2.00@2.10c.; open hearth carriage spring, 2.10@2.25c.; crucible spring, 3.50@3.75c.

Galvanized Sheet Iron.—Demand is keeping up fairly well considering the abnormal condition of affairs. Discounts are steady at 70, 10 and 5% off on Juniata, and 70, 10 and 7 1/2% on charcoal. Jobbing quantities at 70 and 7 1/2% on the former and 10% off on the latter.

Black Sheet Iron.—A very limited demand at present, with chances for better outlook shortly. Prices are: No. 27, common, 2.75c.; jobbers quote 2.95@3.00c. for same gauge for iron; steel sheets remain same as last week, 10c. higher per 100 lbs.

Bar Iron.—The buying has been a trifle more freely than was last week, but the sales are small and the hand to mouth policy looks as though it was going to prevail. People are simply buying according to their wants, and not a particle more than is absolutely necessary. There need be no alarm concerning a sudden jump in prices, for that seems hardly possible for some time to come. The market is steady, with indications that each week brings an improvement to the situation. The Valley mills are asking 1.30c. with freight rates, being 15c. carload lots. Jobbing trade is moderate at 1.50@1.70c. for iron and steel bars.

Billets.—Quite a considerable business has been booked during the past week, as inquiries have mostly resulted in business at \$19.25@19.50; no call for rods, the quotation being nominal at \$27.

Steel Rails.—Small lots continue in demand at \$27@29. No marked change is looked for this year.

Scrap.—Prices are still low with but small demand. Sales are chiefly in small lots. Prices are: Railroad, \$11; No. 1 forge, \$10; axles, \$10; cast borings, \$5; wrought turnings, \$6.50; axle turnings, \$3; leaf steel, \$14.50; mixed steel, \$7; tires, \$13.50.

Nails.—Trade continues very dull. There is a fair demand for steel cut rails in mill lots. The Darnall nail plant, at Muncie, Ind., has leased its puddle mills to a co-operative company composed of former employees, this company being at present in the hands of a receiver. The new company will be known as the Muncie Muck Bar Iron Company. Steel cut nail prices remain at \$1.18 here and jobbers quote \$1.35; wire nails—the demand is about the same at \$1.30@1.45 for jobbing stock.

Old Rails and Wheels.—A few purchases merely for speculative purposes have been made during the past week of old wheels at \$10.75. The price asked is \$13, and nobody desires to sell at much less than that figure. Old steel rails are quiet at \$8 to \$10. Old iron rails are quoted at \$14.

Philadelphia. Nov. 30.

(From our Special Correspondent.)

Pig Iron.—Unsettled conditions prevail in all branches of the iron trade, especially in crude iron. The fact that stocks are very low does not stimulate buying, although there have been a good many inquiries received from parties who are known to have very little material on hand. Average quotations for No. 1 foundry irons are \$14; No. 2, \$13; gray forge, \$11.50@12.50; very little forge is selling owing to the fact that the mills are not securing any orders.

Muck Bars.—Quotations have been shaded 25c., but no business has developed.

Steel Billets.—Western competition has depressed prices still lower, and sales have been made as low as \$19.30, with \$19 offered; \$20 is the asking price. Only small orders can be picked up at any figure, and the outlook for large orders is not so encouraging as it was two or three weeks ago.

Merchant Iron.—Mill owners report a very quiet demand on a basis of 1.40 to 1.60. No large orders are to be had. Several manufacturers who have been idle for two or three or four weeks are trying hard to get orders enough to warrant them in starting up.

Nails.—The nail trade has dwindled to small proportions, on account of the recent placing of all large orders. The market is very unsatisfactory. Quotations, \$1.20.

Sheet Iron.—An effort has been made by one or two large manufacturers of sheet iron to secure orders for the winter, but, as usual, without success, except in getting a few small orders.

Wrought Iron Pipe.—One or two inquiries have been made for wrought iron pipe, but no sales have been effected.

Plate and Tank.—The week has passed without any event deserving of comment, even inquiries having fallen off. But the brokers and manufacturers know where business is to be had, and have all their calculations made for securing it. Buyers know just what prices they will have to pay; mill-owners are very short of work and anxious to secure new business.

Structural Material.—An effort has been made to induce parties having large requirements to place orders now, but without success. Tariff agitators have a good deal to do with the delay in placing orders, as every one in the trade wants to know how things are going to turn out before placing business.

Steel Rails.—There have been so many contradictory assertions made by parties who ought to

know facts, in regard to the present condition of things in the steel rail trade, that it is rather dangerous to make positive statements. It appears, however, to be fixed that tidewater quotations are \$24.80. There are some elements of uncertainty, however, which may disturb existing quotations, despite the fact that a decisive agreement is said to have been entered upon. Very few new orders have been placed. Brokers who are well posted in steel rail matters say some large orders will be placed as soon as everything is definitely settled.

Old Rails.—Quotations are nominally \$14.

Pittsburg. Nov. 30.

(From our Special Correspondent.)

Raw Iron and Steel.—In regard to business there is nothing of special importance to communicate to our readers. There continues to be irregularity in the leading branches of the iron and steel trades, and the market generally is in a weakened condition; prices have reached a level here, below which it is apparently not possible for them to go with the present cost of manufacture. The arrangements which have been made to remove the possibility of any further cutting in the prices of steel rails, and the absence of any pressure on the part of the leading producers of crude iron to effect sales, have tended to inspire greater confidence on the part of the producers in the course of the market after the opening of the new year.

Buyers show little anxiety to invest, notwithstanding the fact that prices are the lowest ever recorded. The largest inquiry was for Bessemer pig and steel billets and slabs. With so many mills and other works starting in various directions there will soon be an improved demand for raw material and makers are of the opinion that there will be a reaction in their favor in the near future. As promised in our last report the Valley mills fired up according to announcement, giving employment to many thousand workmen who are evidently well pleased with the outlook. The mills and furnaces will be kept running as long as business will justify; owing to the lateness of the various works starting it is very probable that the January closing down for repairs and stock-taking will be dispensed with.

Pittsburg manufacturers and business men generally are in receipt of news in regard to an advance in freight rates to Southern points that will make business with the South in a measure prohibitory, the advance to take effect December 4th. The Southwestern Traffic Association have advanced the rate over 100%, and the shippers in this vicinity will lose on all goods for which they have taken orders to be sent to points south and west of the Mississippi River. The figures are: Agricultural implements, from 31c. per 100 lbs. to 68c.; glass ware, 30 to 92c.; on all other commodities there has been a proportionate advance in rates.

We quote the following transactions:

Coke Smelted Lake and Native Ore.		Muck Bar.	
Tons.	Cash.		
2,000 Bessemer, Dec.		500 Neutral, Dec.	20.75
Jan.	\$11.10	300 Neutral, prompt.	21.29
2,000 Bessemer, Dec.	11.00	200 Neutral	21.15
1,000 Bessemer, Valley		200 Neutral	21.25
Furnace	10.75	Skelp Iron.	
1,000 Bessemer, Dec.		1,000 Sheared	1.50 4 m.
Jan.	11.50	500 Narrow grooved.	1.35 4 m.
1,000 Bessemer, Dec.	11.25	550 Wide grooved.	1.35 4 m.
500 Bessemer	11.25	450 Narrow grooved.	1.35 4 m.
500 Bessemer	11.15	350 Sheared	1.50 4 m.
500 Gray Forge, Dec.		Skelp Steel.	
Jan.	10.50	360 Wide grooved	1.20 4 m
500 Mill	10.50	Sheet Bars.	
500 Gray Forge	10.50		Cash.
300 Gray Forge	10.50	500 At maker's mill	\$23.50
300 Mill	10.50	Ferro Manganese.	
200 Mill	10.50	300 Domestic, 80 p. c.	52.50
300 No. 1 Foundry	13.00	50 Domestic, 80 p. c.	53.00
200 Mottled	10.00	Steel Wire Rods.	
500 Extra Gray Forge	11.00	1,500 5 gauge American	25.00
200 No. 2 Foundry	11.75	at mill	
150 No. 2 Foundry	11.75	Blooms, Billets and Bar Ends.	
100 No. 3 Foundry	11.00	500 At mill	12.00
50 No. 2 Foundry	11.75	Charcoal.	
25 No. 2 Foundry	12.00	50 Warm Blast	18.00
Steel Blooms, Billets and Slabs.		50 Cold Blast	25.50
3,000 Billets and Slabs		50 Cold Blast	24.50
next three months		50 No. 2 Foundry	18.00
at mill	17.25	Old Rails.	
3,000 Billets, Dec. at		400 Steel, short pieces	12.50
mill	17.00	200 Iron rails	15.25
2,000 Billets, Dec.		Scrap Material.	
Jan., at mill	17.30	500 Wrought scrap,	
1,200 Billets and Slabs,		net	10.20
Jan., at mill	17.25	300 car axles, net	15.00
1,000 Billets, Dec., at		275 Cast scrap, gross	3.50
mill	17.20	150 Light steel scrap,	
750 Billets, Dec., Jan.,		gross	7.25
at mill	17.25	50 Cast iron scrap,	
500 Billets, prompt, at		gross	12.25
mill	17.50		

Cartagena. December, 1893.

(Special report of Barrington & Holt)

The iron ore trade still continues stagnant. It is difficult to obtain tonnage at anything like normal rates, principally owing to the continued coal troubles in England and the quarantine regulations imposed on steamers from abroad. The quarantine has now, however, been taken off. The firm of Wm. Baird & Co., of Glasgow, Scotland, has recently acquired the Negro mines in the province of Seville—a valuable property. We quote: Ordinary 50% Portman ore, 5s. 2d. per ton f. o. b.; low phosphorus 50% ore, 5s. 8d. @ 6s. 2d.; No. 1 manganiferous, 20% iron

and 20% manganese, 12s. 3d.; B manganiferous, 25% iron and 17% manganese, 8s. 9d. @ 9s. 3d.; low grade manganese, 5s. 9d. @ 7s. 3d.; manganese ore, 10d. per unit; iron pyrites, 40% iron and 45% sulphur, 11s. A fair amount of most grades is on hand for shipment.

METAL MARKET.

NEW YORK, Friday Evening, Dec. 1, 1893.
Prices of Silver per Ounce Troy.

Nov.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$1.	Nov.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$1.
25	4'85 1/4	32 1/8	69 1/4	.535	29	4'85 1/4	32	69	.533
27	4'85 1/4	32 1/8	69 1/4	.535	30	4'85 1/4	32 1/8	69 1/4	.533
28	4'85 1/4	32	69 1/4	.535	1	4'85 1/4	31 1/8	69 1/4	.531

There are no new features in silver. Very little is now doing in forward sales, as the smelting companies preferring to wait a very good demand exists for prompt shipments, and all bullion in immediate sight is easily disposed of for the Eastern markets, but the tendency in price is slightly downward.

The United States Assay Office at New York reports the total receipts of silver for the week to be 106,600 ounces.

Gold and Silver Exports and Imports at New York, Week Ending November 25th, 1893, and for Years from January 1st, 1893, 1892.

Week	Gold.		Silver.		Excess of Ex. or Imp.
	Exports.	Imports.	Exports.	Imports.	
1893...	\$29,060	\$80,952	\$936,312	\$34,340	E \$850,080
1892...	70,311,114	62,059,329	23,916,131	3,118,490	E 31,057,476
1892...	59,997,653	8,072,657	19,903,816	2,937,263	E 68,892,209

The imports, both of gold and silver, for the week were from the West Indies and Central America. The gold exports for the week went to the West Indies; the silver partly to the West Indies, but chiefly to Europe. Specie and bullion simply in transit are not included.

Shipments of silver continue large. The German steamer Aller on Thursday, 30th, took 325,000 oz. of which 100,000 oz. were shipped by Handy & Harman, and 175,000 oz. by Hoskier, Wood & Co.

During the five days ending November 30th, the exports and imports of gold and silver have been as follows: Exports, gold, \$113,000; silver, \$559,315; imports, gold, \$681,406; silver, \$8,037. Of the silver exported \$52,700 went to China; all the rest went to London. All the gold was in United States coin, and went to the West Indies.

NOTES OF THE WEEK.

While no great or marked revival in trade has begun, a gradual improvement in the business situation is apparent. The volume of transactions is slowly increasing, closed factories are opening again and the settlement of business difficulties is progressing with less friction. It is true that there is still a tendency to very low prices and to a reduction of wages in many trades; but these must be expected. In some cases these are necessary but in some also manufacturers are taking advantage of the general cry of "hard times" to cut down. In some quarters, especially in the textile trades, there are threats of closing factories again; but there is no doubt that some of these are made chiefly for effect on the coming discussions at Washington.

The new tariff bill prepared by the Ways and Means Committee is, of course, a general subject of discussion, and opinions upon its provisions vary widely according to preconceived ideas and to special interests. The immediate effect of its publication on Wall street was a fall in the trust stocks generally, in some of the industrials, and in a few railroad stocks. Since then, however, there has been a partial recovery.

No change is noticeable in the metal markets which are reported in these pages.

A minor feature, which still shows some improvement in the situation, is a considerable increase in real estate transactions in New York, chiefly in smaller properties for investment. The sales of such property almost ceased for a time, but are now again increasing, showing that hoarded money is coming out. This shows also, in all probability, that foreign money is beginning to come here again, since New York city real estate is much favored by a certain class of German investors. To how great an extent it is held abroad it is impossible to determine exactly, since under New York law aliens cannot hold real estate, and titles are taken nominally by some one here; but the total amount is known to be large.

The statement of the New York banks for the week ending Saturday, November 25th, shows increases of \$5,364,700 in reserve, \$3,468,900 in loans, \$1,069,300 in specie, \$6,952,300 in legal tenders, \$10,627,600 in deposits, and a decrease of \$224,700 in circulation. The reserve was \$70,835,175 in excess of the 25 per cent. required by law. The accumulation of money still continues, but there was some increase in loans.

The New York banks, in order to avoid the trouble and risks incident to handling and transferring

large amounts of gold coin, now that the Treasury has ceased issuing gold certificates, have made an arrangement by which, beginning December 1st, the Clearing House will receive deposits of gold coin, against which it will issue certificates to be used in the settlement of balances as provided for and authorized by the National Banking Act. The vaults in which the gold is to be deposited are on the Mercantile Safe Deposit Company's premises, and they have been rented by the Clearing House for a term, with the privilege of renewal for one or more years. The Safe Deposit Company is to have nothing to do with the deposit of the gold, further than renting the vaults. The certificates of deposit will be issued by the Clearing House; they will be of the denominations of \$5,000 and \$10,000, and will be signed by Frederick D. Tappen, chairman of the committee, and countersigned by William Sherer, manager of the Clearing House, who will register them. The gold will all be carefully tested and weighed by experts before the certificates are issued. Probably between \$20,000,000 and \$25,000,000 will be deposited in the aggregate by the associated banks.

The statement of the United States Treasury on Wednesday, November 29th (30th being a holiday), shows the total balance in excess of outstanding certificates, \$93,821,553, a decrease of \$479,395 from the preceding week. Of the total balance there was reported \$33,320,198 in gold, \$5,694,710 in silver, \$3,778,242 in legal tender, \$1,023,293 in treasury notes, etc. The gold shows a decrease of \$1,188,100 for the week, or more than twice that of the total.

At the same date the silver dollars and bullion on hand in the Treasury under the law of July, 1890, amounted to \$153,453,629, against which the treasury notes outstanding amounted to \$153,274,280.

A statement prepared at the office of the Internal Revenue Bureau shows that the collections from that source for the first four months of the fiscal year 1893-94, July, August, September and October, were \$49,435,005, a decrease of \$6,825,015 as compared with the first four months of the preceding fiscal year. The principal item of the decrease has been spirits, \$4,009,082; tobacco, \$2,077,303. The receipts for October last were \$1,303,572 less than for October, 1892, being a decrease of \$978,223 on spirits and \$248,418 on tobacco.

A Washington dispatch says: Director of the Mint Preston has submitted to the Secretary of the Treasury a report of the operations of the mints and assay offices for the fiscal year ended June 30th, 1893. It shows that the value of the coinage executed at the mints during the fiscal year was: Gold, \$30,038,140; silver dollars, \$5,343,715; subsidiary silver coin, \$7,217,221; minor coin, \$1,086,102; total, \$43,635,178. The number of pieces coined was 97,280,875.

The coinage of the world for the calendar year 1892 is stated to have been: Gold, \$167,917,337; silver, \$143,096,239.

The amount of gold and silver used in the industrial arts in the United States during the calendar year 1892 is estimated to have been: Gold, \$16,916,408; silver, \$9,106,540.

Imports of gold during the year were \$22,069,380, of which \$6,074,869 was United States coin. Exports of gold were: Domestic coin and bullion, \$102,337,537; foreign coin and bullion, \$6,629,298; total, \$108,966,835. Imports of silver were \$34,293,999. Exports were: Domestic silver, \$24,625,409; foreign silver, \$17,322,403; total, \$41,947,812.

The amount of silver bullion offered for sale to the government during the year aggregated 98,467,800 fine ounces. The amount purchased was 54,008,162 fine ounces, costing \$45,531,374. The average price paid per ounce was \$8.43.

The total amount of silver bullion purchased under the act of July 14th, 1890, to November 1st, 1893, was 168,674,682 fine ounces, costing \$155,931,002. The average price per fine ounce was \$0.9224. The coinage value of the total amount purchased (in silver dollars) was \$218,084,431.

The total number of silver dollars coined under the act of July 14th, 1890, from August 13th, 1890, to November 1st, 1893, was 36,087,255, on which the seigniorage was \$6,977,098. The balance of silver bullion on hand November 15th, 1893, was 140,699,825 fine ounces, costing \$126,758,280.

Since April 1st, 1873, the government has been a large purchaser of silver. The total amount purchased was 496,984,899 fine oz., at a cost of \$508,933,975. The total number of silver dollars coined since March 1st, 1878, was 419,332,550.

The stock of metallic money in the United States July 1st, 1893, is estimated to have been: Gold, \$597,697,685; silver, \$615,861,484; total, \$1,213,559,169. The amount of money in active circulation, exclusive of the amount held by the Treasury, is stated as \$1,596,701,245.

The production of precious metals in the world during the calendar year 1892 is estimated to have been: Gold, \$138,861,000; silver, \$196,458,800.

The steady drain of gold from London to the Continent continues, although no notably large amounts have been taken during the week. There is still a considerable amount needed by Austria to complete its currency reform, and the government is buying wherever opportunity offers. The masked demand for Russia still continues, and is causing some little uneasiness in London. Upon the whole the situation is not considered satisfactory, especially as the papers continue to anticipate a heavy demand for gold from the United States in the near future, and

are talking of measures to check the outflow. The Bank of England discount rate remains unchanged, but an increase in the rate is expected. The price of gold remains very nearly the same, but the latest quotations are a fraction lower, 77s. 1 1/2d. per oz., against 78s. last week.

The Vienna correspondent of the London "Economist" says: The premium on gold still refuses to fall, and will probably remain obdurate until the government's action in the currency reform begins in earnest. In a month's time bills will be presented, providing for the withdrawal of the 1fl. notes and part of the 50fl. notes, and for the giving over to the Bank of 200,000,000 gold crowns in exchange for 70,000,000 silver florins and 30,000,000 notes of the state. The two mints have been instructed to work so hard that the whole amount of gold coins necessary will be ready in a year, and cash payments on the crown system may begin upon January 1st, 1895. The two states are under the obligation also to give gold in exchange for the 90,000,000 silver florins which will remain in the hands of the bank. For all this silver, the government has a use, as it is to be coined into one-crown pieces, of which 180,000,000 are to be coined, since, to judge by what the German Empire and other countries with gold standards require for their silver circulation, Austria-Hungary will want about 350,000,000 crowns. The 70,000,000 silver florins which the bank has in addition to these 90,000,000, will be used for coining Maria Theresa thalers for the East and Africa, where they are very much in demand since the free coinage of rupees has been stopped in India. So the loss will not be as great as if the silver had to be sold at the present price. It is to be expected that as soon as international investors see that the government is serious about realizing the reform, they will take up the Austrian and Hungarian stocks again, and the premium on gold might disappear even before cash payments were resumed.

It is stated by the "Kokkai Shimbun," a paper supposed to speak with authority, that the Japanese government will soon appoint a monetary commission to consider the difficulties arising from the present influx of silver and the increasing scarcity of gold. One remedy proposed is the raising of a gold loan by the government and the use of silver as far as possible in paying foreign debts. The object is to increase the stock of gold as much as possible and to diminish that of silver. The reserve of the Imperial Bank of Japan on September 6th was 64,630,000 yen in silver, and this had been steadily increasing for some time.

Japan has nominally a double standard, which has been for some time past practically a silver standard. In this connection an interesting letter in "l'Economiste Francais" gives some particulars of the circulation of Japan. There is no gold in general use and the silver is mainly held by the Bank of Japan as a reserve. The circulation is chiefly paper, and the outstanding amount on May 31st last was 143,149,612 yen, including 13,880,886 yen in government bills, 105,636,803 yen in notes of the Bank of Japan and 23,361,923 yen in notes of the national banks. For some years past the amount of government bills has been decreasing and that of notes of the Bank of Japan increasing; in 1889 of a total of 125,829,218 yen in paper money the proportion was: Government bills, 28 1/2%; Bank of Japan notes, 49 1/2%; notes of national banks, 21 7/8%. In 1893, as shown by the statement above, with an increase of 17,320,394 yen, or 13 1/4% in the total, the proportion was: Government bills, 9 7/8%; notes of Bank of Japan, 74 0/100%; notes of national banks, 16 3/100%. It may be added that the coinage value of the silver yen, practically the standard, is 77c., its actual value is now about 47c. The gold yen is valued at 90c.

The London "Economist" gives a comparative table of English prices of minerals at the beginning of November for three years past; the price in each case is per long ton, and we have reduced them to American currency:

	1893.	1892.	1891.
Scotch pig iron.....	\$10.13	\$10.14	\$11.46
Cleveland bar iron.....	23.40	25.20	26.40
Steel rails.....	18.00	20.14	20.40
Copper, Chile bars.....	202.50	217.80	220.20
Tin, Straits.....	370.50	455.80	433.44
Lead, English pig.....	48.30	49.30	48.30
Coal, house, in London.....	4.56	3.93	3.54

Coal prices show an abnormal increase due, of course, to the strike just ended.

Domestic and Foreign Coins.

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

	Bid.	Asked.
Mexican dollars.....	\$.56	\$.57 1/2
Peruvian soles and Chilean pesos.....	.52	.54
Victoria sovereigns.....	4.87	4.89
Twenty francs.....	3.87	3.90
Twenty marks.....	4.74	4.78
Spanish 25 pesetas.....	4.78	4.82

Other Metals.

Copper.—After a prolonged period of dullness, as far as home trade was concerned, with prices continually declining, the market has, at last, taken a turn upward, growing firmer day by day as the demand from the larger consumers increases. Simultaneously with the springing up of this demand from a quarter from whence practically no orders had come for months, there came a speculative die

mand, with the natural result that prices for lake copper rapidly advanced until now we have to quote 10.40@10.50c. per pound, with the quantities available much smaller than in former years when not so much had been sold for export as to materially curtail the quantities which could be brought down prior to close of lake and rail navigation. Considering the fact that to bring copper down during the winter costs half a cent a pound more in freight alone, present supplies are all that can reasonably be looked for as available to meet the current demand which ought to be, comparatively speaking, very much larger than usual, as very few of the manufacturers have bought much ahead. Other descriptions have not advanced in proportion with lake, as electrolytic copper in cakes, ingots or bars can still be had at 10c., and in cathodes at 9½%; while casting copper we have to quote at from 9½% to 9%. It cannot be expected that this disparity will long continue.

The demand for copper to go abroad has been limited, as people on the other side will not pay the higher prices ruling here now. However, as G. M. Bs. are now coming rather higher, the chances are that fair support will continue to be received from the other side, where consumption continues to exceed all expectations, the statistics for the last fortnight showing a decrease of 400 tons in visible supplies, in spite of the heavy shipments from here, which have been said by some home manufacturers to have been made against orders placed by speculators. This, however, does not seem to have been the case, as, if it had, visible supplies would have increased, not decreased.

From England we hear that the larger smelting works in Wales, the running of which has been greatly interfered with by the coal strikes and the consequent lack of fuel, have now resumed producing best selected, thus doing away with the scarcity of this description of copper, for which very full prices are being asked. At the close G. M. Bs. are quoted at £43 5s. for spot and £43 15s. for three months prompt, and other sorts as follows: English tough, £46@£46 5s.; best selected, £47 5s.@£47 10s.; strong sheets, £54 5s.@£54 10s.; India sheets, £51 10s.@£52; yellow metal sheets, 4½d.

The exports of copper from the port of New York during the week ending December 1st, as reported by the New York Metal Exchange, were:

Copper:		
Hamburg—Polynesia.....	Ingots	90 tons
" " " " " " " " " "	Plates	30 "
" " " " " " " " " "	Cakes	65 "
" " " " " " " " " "	Bars	20 "
Rotterdam—Patapsco.....	Cakes	76 "
" " " " " " " " " "	Bars	112 "
" " " " " " " " " "	Ingots	10 "
" " " " " " " " " "	Plates	50 "
" " " " " " " " " "	Ingots	35 "
" " " " " " " " " "	Plates	40 "
" " " " " " " " " "	Ingots	50 "
Havre—La Champagne.....	Ingots	50 "
Liverpool—Tauric.....	Ingots	25 "
Rotterdam—Rotte dam.....	Ingots	150 "
Antwerp—Friesland.....	Ingots	30 "
Hamburg—Russia.....	Plates	25 "
" " " " " " " " " "	Cakes	30 "
Liverpool—Teutonic.....	Ingots	100 "
Havre—La Champagne.....	Ingots	55 "
" " " " " " " " " "	Pigs	30 "
Rotterdam—Loch Marre.....	Ingots	30 "
Stettin—Bohemia.....	Plates	40 "
Rotterdam—Obdam.....	Ingots	170 "
" " " " " " " " " "	Plates	145 "
" " " " " " " " " "	Bars	50 "
Hamburg—Sorrento.....	Ingots	71 "
Copper matte:		
Liverpool—Tauric.....		292 "

The exports of copper from Baltimore for the week ending November 30th were as follows:

Copper:		
Nov. 21st. Liverpool—Sedgemore	911 cakes	161,272 lbs.
" " " " " " " " " "	314 bars	31,502 "
" " " " " " " " " "	1,164 plates	243,969 "
" " " " " " " " " "	6 bbls	6,720 "
Nov. 24th. Antwerp—Rialto.....	761 cakes	197,182 "
" " " " " " " " " "	81 bars	11,228 "
Nov. 25th. Liverpool—Rossmore.....	598 bars	67,304 "
" " " " " " " " " "	78 cakes	8,955 "
Nov. 24th. Rotterdam—Chicago.....	717 cakes	318,230 "
" " " " " " " " " "	1,444 ingots	22,400 "
" " " " " " " " " "	861 bars	112,368 "

Other metal shipments reported from port of Baltimore for the week are as follows: November 21st, per steamship "Merito," for Glasgow, 3 casks spiegel, 14,290 lbs.; per "Sedgemore," for Liverpool, 24 casks chrome iron ore, 21,500 lbs.; 53 barrels and 170 bags zinc dress, 87,610 lbs. November 24th, per "Rialto," for Antwerp, 680 barrels manganese ore, 693,880 lbs.

Tin.—A marked improvement in this article is noticeable, and with deliveries better than for some time past, quotations are rather firmer at 20% to 20½% for spot and September. The foreign market has been depressed somewhat, a noteworthy feature being that of late the price of tin has fallen or risen in sympathy with the silver quotations. Shipments from the East during the month of November were rather heavy, and there is an increase of 700 tons in visible supplies abroad to be reported. However, this cannot be considered as an unfavorable sign, as there has been so little bought by the United States during recent months that a resumption of purchases will soon improve the situation generally. Quotations at the close are £75 7s. 6d. for spot and £76 for three months prompt.

Lead.—The sweeping reforms proposed in the tariff bill recently made public have caused considerable agitation, but the putting on the free list of silver-lead ores, as also a reduction in the duty on pig lead, having been anticipated, the effect upon

the market has been practically nil. Since the beginning of the panic of the past summer, prices for pig lead have been from ¾c. to 1c. per lb. lower than for many years past, and, with the silver and lead markets in their present condition, the only reason for a continuation of such prices lies in the fear of imports of foreign lead being made if higher values become fixed.

The removal of duties upon Mexican lead ores will have but little effect other than to enable the Mexican miner to get rather more for his produce. Besides, there is a probability of the Mexican Government retaliating by imposing an export duty on such ores, a possibility which was taken into account in the framing of the proposed tariff bill, as is shown by the incorporation therein of a clause providing that if any foreign country levies an export duty upon lead or lead-silver ores, then the present rate of duty shall be imposed upon imports of such from that country.

The market itself is very firm at 3.40@3.45 for spot, sellers being exceedingly few.

The market abroad is dull, with lower prices ruling, as we have to quote Spanish lead at £9 8s. 9d.@£9 11s. 3d. and English lead at 2s. 6d. more.

St. Louis Lead Market.—The John Wahl Commission Company telegraph us as follows: Lead firm and fairly active at 3.20c.; about 600 tons have sold at this price since our last report. Transactions are more or less restricted owing to some desilverizers asking more for the metal.

Spelter.—With a much better demand from consumers, especially galvanizers, values have advanced and sales been made at rather higher prices. We quote spot at 3.875@3.90 and January at 3.925@3.95.

In Europe, also, prices are firm, good ordinaries being valued at £17 1s. 3d. and specials at £17 3s. 9d.@£17 5s.

Antimony continues to be dull, Cookson's at 10½, L. X. at 9½ and Hallett's at 9½.

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

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Dec. 1.

Heavy Chemicals.—The usual effect of a holiday has been noticeable in the heavy chemical trade, and the market has been devoid of new features.

Quotations are nominally as follows: Caustic soda, 90%, 3.05@3.20c.; 70%, 2.80@3c.; 74%, 2.82½@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, 1.05@1.10c.; American, 92½@1c. Bleaching powder, 2.25@2.50c.

Acids.—We have nothing new or interesting to report of the acid market. It continues quiet and unchanged both as to the nature of the business doing and as to prices. We quote this week: Acids, per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, in barrels, \$1.75@1.87½; muriatic, 18", 90c.@\$1.10; 20", \$1@1.25; 22", \$1.10@1.35; nitric, 40", \$1; 42", \$1.50@1.75; sulphuric, 75c.@\$1. Mixed acids, according to mixture, oxalic \$6.70@6.50. Blue vitriol is quoted all the way from \$3.50 to \$3.75; glycerine for nitroglycerine, 11½@12½c., according to quality and quantity.

Brimstone.—The brimstone market continues quiet. Prices are unchanged from last week. We quote, best unmixed seconds: On the spot, \$19; shipments, \$17.50. Thirds are 75c. less.

Fertilizing Chemicals.—The end of the month has brought little relief to the fertilizer market. During the past week nothing of interest has developed. Prices show no change of importance, and we quote: Sulphate of ammonia, on the spot, gas liquor, \$3.50@3.55; bone, \$3.25@3.30. Dried blood, \$2.60@2.75 per unit for high grade, and \$2.35@2.45 for low grade. Azotine, \$2.60@2.70. Concentrated phosphate (30% 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, \$26@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, \$11.14½; Charleston and Savannah, \$11.7 cwt., basis 48@50%, in 50-ton pots on foreign weights and analyses, Sulphate of potash, 90%-96%, basis 90%; New York and Boston, \$2.07, Philadelphia, \$2.09½; Charleston and Savannah, \$2.127, sulphate of potash, 96.99%, basis 90%, is 4% higher.

Phosphates.—Our special Charleston, S. C., correspondent writes us as follows: Everything in the fertilizer line, including phosphate rock, is dull and in a demoralized condition. Quotations are as follows: Land rock, 60% bone phosphate of lime, \$5. f. o. h. vessel; 62%, \$5.25; river rock, 58%, \$6—all kiln-dried.

Muriate of Potash.—The prices fixed by the syndicate for 1893 are as follows: New York or Boston, \$1.78; Philadelphia, \$1.80½; Southern ports, \$1.83.

Kainit.—Quotations for shipments are as follows: New York, Philadelphia and Boston, \$9 for foreign invoice weight and test, and \$9.25 for actual weight; Charleston, Savannah and Wilmington, \$9.75 for invoice weight and test, and \$10 for actual weight.

Nitrate of Soda.—The nitrate market is quiet. Quotations are \$1.85@1.90, on the spot, according to quantity.

Liverpool.

Nov. 22.

(Special Correspondence of Joseph P. Brunner & Co.)

Since our last report the principal feature here is, of course, the termination of the coal strike, after having lasted for 16 weeks. It will take a little time for supplies of fuel to be properly resumed, but in the course of 7 to 10 days manufacturers whose works have been stopped for want of fuel expect to be able to make a start again. So far, the end of the coal strike has not had very much effect on our market for chemicals, except to slightly weaken caustic soda and bleach. For immediate delivery, supplies are extremely limited, but manufacturers are now in a position to quote for December and forward deliveries.

Soda Ash.—There is practically nothing offering for prompt delivery, and for Leblanc makes the nominal quotations are about as follows: Caustic ash, 48%, £3 15s.@£4 5s. per ton; 57, 58% £4 10s.@£4 5 per ton, carb. ash, 48%, £3 15s.@£4 15s.; 58%, £4 10s.@£5 net cash.

Ammonia ash 58% is scarce and for any position quotations range from £4 per ton net cash to £4 5s. per ton, less 2½% for casks; bags 5s. less. Soda crystals are quiet at £3 per ton, less 5%.

Caustic Soda.—There is more inquiry for this article, as orders which have been kept back pending a settlement of the coal strike are now being placed. Prices are easier, at £9 10s. for 60% and £10 10s. for 70% for second-hand lots, immediate delivery, and about 5s. per ton less money for first half December delivery. Bleaching powder is slow of sale and rather lower at £8 10s.@£8 15s. per ton, net cash, for hardwood casks.

Chlorate of potash, although scarce, is in light demand, and for November December there are sellers at 8d. less 7%@7½%. For all 1894, 7½d. less 5% is nearest value. Bicarb. soda is not active, but price keeps firm at £7 per ton less 2½% per 1 cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia is again dearer and holders now quote £13 12s. 6d.@£13 15s. per ton less 2½% for good gray 24½@25% in double bags f.o.b. here. Nitrate of soda is without special feature and may be quoted at £9 10s.@£9 12s. 6d per ton less 2½% for double bags f. o. b here.

Carb. Ammonia—Lump 3½d. per lb.; powdered 3½d. per lb., less 2½%.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburg, St. Louis, London and Paris, see pages 581, 585 and 586.]

NEW YORK, Friday Evening, Dec. 1.

The past week in the mining stock market has been one of the dullest on record, and that is saying a great deal, as our market has shown and can show some of the dullest weeks ever passed in any market for mining securities in this world. It must be admitted that to some extent the Thanksgiving holiday is to blame this week, and this revives an old query: For what should mining stock brokers give thanks? In this case, one of the persons in question states that they ought to be thankful that they have not all starved to death long ago.

The "boom" at San Francisco seems to have gone the way of all "booms" which are not based on substantialities. It has met the fate that has befallen all such attempts which have been made of late years. Prices of Comstocks, with but very few exceptions, have undergone a marked, and, we may add, a deserved decline. Here the volume of business has dwindled down to insignificant proportions.

Consolidated California & Virginia shows a sale of 100 shares at \$1.50; at the close the price was \$1 lower. Of Ophir 200 shares changed hands at \$1.95 @ \$2.10. Comstock Tunnel, as usual, shows the heaviest transactions in point of numbers; during the week 3,100 shares were sold at 8c. Other sales were as follows: 199 shares Best & Belcher at \$3.05, 225 shares of Mexican at \$1.2 @ \$1.35.

Brunswick Consolidated was the only California stock to show any sales this week; of this stock 200 shares were sold at 7c.

The Superintendent of the Brunswick Consolidated Gold Mining Company writes as follows from Grass Valley under date of November 22d: The ledge in the 700 level continues small but the quality of the ore is very good, it being highly mineralized and showing well in free gold. The ledge in the stope is improving; it is from 10 to 18 in. wide and shows well in free gold and sulphurets.

Phoenix of Arizona was in very fair demand this week, 3,200 shares being sold at 50@56c.

The only Colorado stock to show any transactions this week was Lacrosse, of which 700 shares changed hands at 6c.

The directors of the Bulwer Consolidated Mining Company have been authorized by the stockholders to sell the stock accumulated in the treasury of the company for non-payment of the last assessment.

Boston. Nov. 29.

(From our Special Correspondent.)

The month closes with a much better market for copper stocks, and higher prices all through the list. The strength of innot copper has stimulated activity and induced good buying, both for investment and speculation, and indications all point to still higher quotations in the near future.

There has been a good demand for the Montana

stocks, and there is not a large supply of them in the market. Boston & Montana has ruled steady from \$2 1/2 to \$2 3/4.

Butte & Boston is much inquired for, and advanced from \$9 to \$9 1/2, and closed strong at the highest figure, with sales of about 3,000 shares.

The demand for Calumet & Hecla is beyond the supply, and the advance from \$290 to \$295 brought but little stock.

Tamarack was also strong, and advanced from \$135 to \$137, and sold ex-dividend \$4 at \$140, equal to \$7 advance for the week.

Quincy opened at \$108 and advanced to \$115, and is strongly held at this figure.

Osceloa advanced from \$29 to \$30 for round lots, some small sales being reported at \$30 1/2. Franklin sold at \$11 1/2—an advance of the fraction for the week. Atlantic sold from \$10 to \$11 1/2, with sales of over 1,200 shares—an unusual large amount for this stock.

Centennial and Kearsarge both have been quite active, the former selling at \$30 1/2 and the latter at \$8. Tamarack, Jr., sold at \$19 1/2 to \$19 3/4. Wolverine advanced from \$1 1/2 to 2 1/4, with a good demand. Allouez sold at 30c. and Bonanza at 20c.

3 P. M.—The market after the noon hour was very strong and active. Boston & Montana advanced to \$23 1/2, Butte & Boston to \$10, Calumet & Hecla to \$297, Tamarack to \$146, ex div.; Osceloa to \$30 1/2, Atlantic to \$12, Franklin to \$12, Kearsarge to \$8 1/2, Tamarack, Jr., to \$20, and Wolverine to \$3. Sales about 6,500 shares.

San Francisco. Nov. 21.

(From our Special Correspondent.)

Lively fluctuations have marked the week's trading, but on more than one occasion it has seemed as if the market would go to pieces. Mr. J. Rule has left for the Comstock, and the work on the Rule drift, 1,000 level, will be commenced at once. This in itself will tend to sustain the market. At other points on the lode, particularly in Potosi and Jacket, work of an interesting nature is being carried on.

The recent rally in the stock market has been marked by one or two curious features. The brokers have refused to handle new accounts on other than a cash basis. Only for customers having open accounts or well known on the street are stocks being bought on margin. Since the ruling of the Supreme Court with regard to margin trading very considerable sums have been recovered from the brokers by malcontent speculators. As a consequence the business done during the last week or two has been largely on a cash basis. One firm of brokers allege that 80% of their accounts since the

boom in the market have been for cash. This ought to have a beneficial influence in steadying the market, although generally speaking there are sufficient "chippers" around to break prices when they are forced to unload their holdings.

This morning Consolidated California & Virginia opened firm at \$4.50, but during the morning the stock weakened, selling at \$4.25 in the afternoon session and closing at 5c. advance. Ophir sold steady at \$1.00. Mexican at \$1.15, Sierra Nevada at \$1.40 and Union Consolidated at \$1.00 were in average demand.

Of the middle groups of Comstocks Best & Belcher was active, selling for \$2.90 at the opening session, scaling to \$3.05 and then declining during the afternoon to \$2.75. At these varying prices 5,000 shares were sold. Chollar sold for 90c., Gould & Curry for \$1.45, Hale & Norcross for 90c., Potosi for \$1.05, Savage for \$1.00.

There was quite an active demand this morning in the Pacific Board for certain of the Gold Hill stocks, but prices shade off during the day. Belcher opened at \$1.05 and closed at 10c. off; Bullion sold for 55c., Challenge for 95c., Confidence for \$1.75, Crown Point for \$1.05, Occidental for 25c., Overman for 55c., and Yellow Jacket for \$1.45.

Several good buying orders were received during the afternoon, and prices under this influence became steadier, but most of the stocks closed at from 5c. to 10c. off ruling rates.

SAN FRANCISCO, Dec. 1 (By telegraph).—Opening quotations to day are as follows: Best & Belcher, \$2.30; Bodie, 25c.; Bulwer, 5c.; Chollar, 75c.; Consolidated California & Virginia, \$3.65; Gould & Curry, \$1.20; Hale & Norcross, 85c.; Mexican, \$1.10; Mono, 15c.; Ophir, \$1.70; Savage, 95c.; Sierra Nevada, \$1.35; Union Consolidated, \$1.05; Yellow Jacket, \$1.35.

London. Nov. 21.

(From our Special Correspondent.)

During the past week there has been a general flatness in the mining market. South African gold shares have received very little attention, and the general tendency has been a drooping one. The shares in the Chartered Company of British South Africa have been left alone by the public since the announcement was made that £2,000,000 more of share capital was to be created. No information or details are vouchsafed by the directors, and holders and buyers are left pretty much in the dark. At the meeting held yesterday there was a great deal of talking by the authorities, but very little information was given.

Among American stocks Jay Hawks have shown

to the best advantage during the past week; for these shares there has been some inquiry and the price has gradually advanced by fully one shilling from 7s. 6d. to 8s. 6d. Elk horns also have picked up a little. Poormans have risen 3d. and Gustons have declined 1s. As usual, there have been violent fluctuations in Golden Gates and Golden Feathers, without there being any cause for them. The only wonder is that any one can be found who is foolish enough to touch such stock.

As reported a fortnight ago it has been decided to reconstruct the Idaho Mining Company. Since then I am informed that the directors have some new property in view and that those "in the know" are desirous of obtaining shares in the new company. The new shares are 5s. and are issued as 4s. 6d. paid up. It is said that offers of 6d. a share are freely coming in. When details are given of the new scheme of working it will be time enough to judge of its merits.

The shareholders in the Ruby Mining Company have confirmed the proposition of their directors to wind up the company and dispose of the property. For some time past the mine has been worked on the tributer system and the receipts from this source were £50 a month, while the expenses were £60 per month. The capital money has all been spent, and seeing that every economy had been practiced without success, and in view of the low price of silver, it was considered best for the operations to cease without attempting to reconstruct the company. The property and possessions of the company will, therefore, be sold, in order that the debenture holders may realize something on their charges of £17,930.

The Fisk Gold Mine, Limited, is the name of an English company which has been formed to purchase the property and plant of the Fisk Gold Mining and Milling Company, of Blackhawk, Gilpin County, Colo., and to acquire a property adjoining known as the Teller Fisk mine. The Fisk mine has been worked for two years by the American company and is already paying an excellent dividend. During the first seven months of 1893 the gross output was £28,985, and the net profits £17,743. The ore averages about \$17 a ton and the working expenses are about \$7.50 a ton, though with new machinery lately acquired the cost of treating has been reduced to quite \$2 a ton. The capital of the new company is £200,000, of which £190,000 goes as purchase price and £10,000 as working capital. The vendor takes £66,000 in fully paid up shares and the remainder in cash. The 134,000 shares of £1 each are now being offered to the public. Mr. P. Coulson Bunn, of London, is the mining expert.

CURRENT PRICES.

These quotations are for wholesale lots New York unless otherwise specified.

Table of current prices for various commodities including Acetic, Commercial, Carbonic, Chromic, Hyrobromic, Hydrocyanic, Hydrofluoric, Alcohol, Absolute, Ammoniated, Alum, Copperas, Corundum, Fluorspar, Feldspar, Epsom Salt, Gypsum, Asphaltum, Prime Cuban, Hard Cuban, Trinidad, Egyptian and Syrian, Californian, Marium, Chlorate, Iodide, Nitrate, Sulphur, Borax, Concentrated, Chromine, Cadmium, China Clay, Chlorine Water, Chrome Yellow, Chrome Iron Ore, Chromalum, Cobalt, Copper, Vitriol, Nitrate, Copperas, Corundum, Cryolite, Emery, Feldspar, Fluorspar, French Chalk, Fuller's Earth, Glauber's Salt, Glass, Gold, Kaolin, Lead, Manganese, Mercuric Chloride, Litharge, Magnesite, Lime Acetate, Litharge, Manganese, Mercuric Chloride, Marble Dust, Metallic Paint, Mica.

Table of current prices for various commodities including Mineral Wool, Ordinary rock, Nitre, Nitre Cake, Ochre, Washed Nat Ox'rd, Golden, Domestic, Oils, Mineral, Phosphorus, Platinic Chloride, Plumbago, Potassium, Bromide, Chlorate, Carbonate, Caustic, Iodide, Nitrate, Bichromate, Yellow, Red Prussiate, Pumice Stone, Pyrites, Quartz, Rotten Stone, Sal Ammoniac, Saltpeter, Soapstone, Sodium, Phosphate, Stannate, Tungstate, Hyposulphite, Strontium, Sulphur, Syvinit, Tale, Terra Alba, English, American, Tin, Muriate, Double or strong, Oxymur, Vermillion, Washed Nat Ox'rd, Am. quicksilver, Chinese, Trieste, American, Zinc White, Antwerp, Paris, Red Seal, Muriate solution, Sulphate crystals, THE RARER METALS, Arsenic, Barium, Bismuth, Cadmium, Calcium, Cerium, Chromium, Cobalt, Didymium, Erbium, Gallium, Germanium, Glucinum, Indium, Iridium, Lanthanum, Lithium, Magnesium, Manganese, Molybdenum, Niobium, Osmium, Palladium, Potassium, Rhodium, Ruthenium, Rubidium, Selenium, Sodium, Strontium, Tellurium, Thallium, Titanium, Tungsten, Uranium, Vanadium.

Table of current prices for various commodities including Tin, Muriate, Double or strong, Oxymur, Vermillion, Washed Nat Ox'rd, Am. quicksilver, Chinese, Trieste, American, Zinc White, Antwerp, Paris, Red Seal, Muriate solution, Sulphate crystals, THE RARER METALS, Arsenic, Barium, Bismuth, Cadmium, Calcium, Cerium, Chromium, Cobalt, Didymium, Erbium, Gallium, Germanium, Glucinum, Indium, Iridium, Lanthanum, Lithium, Magnesium, Manganese, Molybdenum, Niobium, Osmium, Palladium, Potassium, Rhodium, Ruthenium, Rubidium, Selenium, Sodium, Strontium, Tellurium, Thallium, Titanium, Tungsten, Uranium, Vanadium.

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NEW YORK MINING STOCK QUOTATIONS.

Table with columns for Name and Location of Company, Dividend-Paying Mines (Nov. 23, 27, 28, 29, 30, Dec. 1), Non-Dividend-Paying Mines (Nov. 23, 27, 28, 29, 30, Dec. 1), and Sales. Lists various mining companies like Adams, Belmont, American Flag, etc.

*Dividend, †Deal in at New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment paid. ¶Dividend shares sold, 333. Non-dividend shares sold, 7,624. Total shares sold, 7,957.

BOSTON MINING STOCK QUOTATIONS.

Table with columns for Name of Company, Dividend-Paying Mines (Nov. 24, 25, 27, 28, 29, Nov. 30), Non-Dividend-Paying Mines (Nov. 24, 25, 27, 28, 29, Nov. 30), and Sales. Lists various mining companies like Atlantic, Banana Development, etc.

Dividend shares sold, 7,436 Non-dividend shares sold, 8,533. Total shares sold, 15,969.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Large 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), and Shares (No., Par), Assessments (Total levied, Date and amount of last). Lists companies like Adams, Alaska-Treadwell, etc.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns: Name and Location of Company, Capital Stock, Shares, Par, Dividends (Total Levied, Date and amount of last, Total paid, Date and amount of last), Name and Location of Company, Capital Stock, Shares, Par, Dividends (Total Levied, Date and amount of last, Total paid, Date and amount of last).

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 Deswood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ¶ Previous to the consolidation in August, 1884, the California had paid \$1,320,000 in dividends, and the Cons. Virginia \$42,380,000. ** 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 & Kly Company which had paid \$3,075,000 in dividends. **** Previous to this company's acquiring Northern Flie, that mine paid \$2,400,000 in dividends against \$125,000 in assessments.

COAL AND COAL RAILROAD STOCKS.

Table with columns for Names of Stocks, Nov. 25, Nov. 27, Nov. 28, Nov. 29, Nov. 30, Dec. 1, and Sales. Lists various coal and railroad stocks with their respective prices and sales figures.

Total shares sold, 81,043.

INDUSTRIAL AND TRUST STOCKS.

Table with columns for Name of Stocks, Nov. 25, Nov. 27, Nov. 28, Nov. 29, Nov. 30, Dec. 1, and Sales. Lists industrial and trust stocks with their respective prices and sales figures.

Total sales, 554,168.

CALIFORNIA.

San Francisco.

Table with columns for Names of Stocks, Nov. 24, Nov. 25, Nov. 27, Nov. 28, Nov. 29, Nov. 30. Lists California stocks from San Francisco with closing quotations.

COLORADO.

Colorado Springs.

Table with columns for Names of Stocks, Bid, Asked. Lists Colorado stocks from Colorado Springs with bid and asked prices.

Denver.

Table with columns for Names of Stocks, High, Low, Sales. Lists Colorado stocks from Denver with high, low, and sales figures.

COLORADO.

Aspen.

Table with columns for Names of Stocks, Price. Lists Colorado stocks from Aspen with their respective prices.

MARYLAND.

Table with columns for Company, Baltimore, Nov. 30, Bid, Asked. Lists Maryland stocks from Baltimore with bid and asked prices.

MINNESOTA.

Table with columns for Company, Duluth, Nov. 24, Bid, Asked. Lists Minnesota stocks from Duluth with bid and asked prices.

Table with columns for Company, Unlisted Stocks, Bid, Asked. Lists unlisted stocks with bid and asked prices.

London Quotations.

Table with columns for Company, Nov. 21, 1893, Buyer, Seller, £ s. d., \$ s. d. Lists London quotations for various companies.

New York Mining Stocks.

Table with columns for Company, Latest quotations, Dec. 1, Bid, Asked. Lists New York mining stocks with latest quotations and bid/asked prices.

ASSESSMENTS.

Table with columns for Company, No., Dinqt. in office, Day of sale, Amt. per sh're. Lists assessments for various companies.

Table with columns for Company, Helena, Nov. 27, Bid, Asked. Lists Montana stocks from Helena with bid and asked prices.

MISSOURI.

Table with columns for Company, St. Louis, Nov. 32, Closing quotations, Bid, Asked. Lists Missouri stocks from St. Louis with closing quotations and bid/asked prices.

Table with columns for Company, Philadelphia, Nov. 30, Bid, Asked. Lists Pennsylvania stocks from Philadelphia with bid and asked prices.

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TO BUILDERS OF PUMPING ENGINES.—Sealed proposals, addressed to the Boston Water Board, and indorsed "Proposal for Mystic Station Pumping Engine No. 4," will be received at the office of the Boston Water Board, City Hall, Boston, Mass., until the 23d day of December, 1893, and at that time will be publicly opened and read. The price proposed is to cover all the expenses incidental to the completion of the work in full conformity with the plans and specifications. The price proposed must be stated both in writing and in figures, and all proposals containing bids not called for in this advertisement will not be entertained. Each bid must be signed by the bidder, and accompanied by a properly certified check for one thousand dollars (\$1,000), payable to the city of Boston, said check to be returned to the bidder unless forfeited under the condition herein stipulated. The amount of the security required for the fulfillment of the contract will be the sum of two thousand dollars (\$2,000) in cash, and a bond for fifteen thousand dollars (\$15,000), with sureties to be satisfactory to the Boston Water Board, and to be residents of Massachusetts. Plans may be seen, and specifications and form of contract can be obtained, at the office of the City Engineer, City Hall, Boston, **THOMAS F. DOHERTY, JOHN W. LEIGHTON, WILLIAM S. M'NARY, Boston Water Board, Office of Boston Water Board, City Hall.**

PUMP—Sealed proposals, indorsed "Proposals for Supplies for the Navy Yard, League Island, Pa., to be opened Dec. 19, 1893," will be received at the Bureau of Supplies and Accounts, Navy Yard Department, Washington, D. C., until December 19th, 1893, to furnish at the navy yard, League Island, Pa., one centrifugal pump with appurtenances. The article must conform to the Navy standard and pass the usual naval inspection. Blank proposals will be furnished upon application to the Navy Pay Office, Philadelphia, Pa. **EDWIN STEWART, Paymaster General, U. S. Navy.**

TO BUILDERS.—Office of the Lighthouse Engineer, Third District, Tompkinsville, N. Y.—Proposals will be received at this office until December 14, 1893, for furnishing the materials and labor of all kinds necessary for the erection and delivery of the Rockland Lake Lighthouse, Hudson River, New York. Plans, specifications, forms of proposal and other information may be obtained on application to this office. **D. P. HEAP, Major of Engineers U. S. A., Lighthouse Engineer.**

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WATER WORKS—Proposals will be received at the Mayor's office in Cadiz, Harrison county, O., until January 2d, A. D. 1894, for plans and specifications, complete, of the best and most modern system of water-works, with estimated cost of complete construction, to be constructed and erected in said village (population, 1,710, if approved and accepted by Council of said village, at a cost not exceeding \$35,000. The Council of said village hereby reserve the right to reject any and all proposals of plans and specifications, or any parts or parts of any plan and specification presented or proposed as aforesaid.

JAMES MOORE, Mayor.

GRADUATION.—Sonora & Sinaloa Irrigation Company, 53 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 holders of time and place of opening proposals and awarding contract. **E. S. NETTLETON, Chief Engineer.**

TO IRON MANUFACTURERS.—Office of the Lighthouse Engineer, Third District, Tompkinsville, N. Y.—Proposals will be received at this office until December 14, 1893, for furnishing the materials and labor of all kinds necessary for the completion and delivery of the metalwork of the Rockland Lake Lighthouse, Hudson River, New York. Plans, specifications, forms of proposal and other information may be obtained on application to this office. The right is reserved to reject any or all bids and to waive any defects. **D. P. HEAP, Major of Engineers U. S. A., Lighthouse Engineer, Third District.**

SUPERSTRUCTURE—Treasury Department, Office of the Supervising architect, Washington, D. C.—Sealed proposals will be received at this office until the 15th day of December, 1893, and opened immediately thereafter for all the labor and materials required for the cut stone and brick work, iron work, wood floor, ceiling and roof construction and roof covering for the superstructure of the U. S. Custom House and Post Office building at St. Albans, Vt., in accordance with the drawings and specification, copies of which may be had at this office or the office of the superintendent at St. Albans, Vt. Each bid must be accompanied by a certified check for a sum not less than 2 per cent. of the amount of the proposal. Proposals must be inclosed in envelopes, sealed and marked "Proposal for the Cut Stone and Brick Work, Etc., for the Superstructure of the U. S. Custom House and Post Office Building at St. Albans, Vt.," and addressed to **JEREMIAH O'ROURKE, Supervising Architect.**

SEWER PIPE—Sealed proposals will be received at the office of the Sewerage Commissioners, Home Bank Block, Brockton, Mass., until December 18th, 1893, for the manufacture and delivery of vitrified, salt-glazed sewer pipe. The estimated quantity of pipe is defined as follows: 12,000 ft. of 5-in.; 3,000 ft. of 6-in.; 11,500 ft. of 8-in.; 7,500 ft. of 10-in.; 1,000 ft. of 12-in. Each proposal must be made upon the blank forms furnished by the Sewerage Commissioners, and be accompanied by a certified check for the amount of \$100. Forms of contract and specifications can be obtained at the above office. **R. P. KINGMAN, A. C. THOMPSON, H. A. MONK, Sewerage Commissioners. F. HERBERT SNOW, City Engineer.**

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