highest point ever reached in the State was in 1882, when 932,762 tons of iron ore were mined. The output of zinc ore in 1889 was 56,154 tons, the largest ever reported, and an increase of 23 per cent. over the previous year.

GRUNDSÄTZE FÜR DEN ABSCHLUSS VON EISENBAHN TARIFCARTELLEN (PRINCIPLES OF THE FORMATION OF RAILROAD
RATE AGREEMENTS): BY HERR EMIL RANK, CHIEF OF
BUREAU OF THE AUSTRIAN NORTHWESTERN RAILROAD.
Vienna, Austria; published by A. Hartleben.

This work is intended, in the first place, as a discussion of the question whether railroad traffic agreements are to be recommended, either from the point of view of the railroads themselves or of the public generally and if this question can be answered in the affirmative, to consider what are the causes of the evils which, it is claimed, traffic agreements have introduced into railroad management. It is intended to consider all those factors which disturb and interfere with the service, and to formulate the principles upon which agreements should be made, basing these on the result of experience. Some consideration is also given to other questions, and especially to that class of agreements which are intended to control the business of districts producing large amounts of traffic.

Some idea of the scope of the book may be gained from the subjects treated in it, which include: Agreements for the Division of Business; Securing Business for Different Routes; Fixing Tariffs under Agreement; Handling of Unbilled Freight; Uniform Division of Profits; Proceeding in Case of Business Disagreements; Right of Mutual Control; Decision of Disputed Questions; Duration of Traffic Agreements; Agreements for Mutual Control of Production Districts.

The subject is treated with the thoroughness which we often find in German works upon this subject, and with much more regard to general principles than we are likely to find in this country. It is well worth the attention of those who are interested in this subject.

Spon's Engineers' Diary and Reference Book, for Engineers, Machinists, Contractors and Users of Steam.

London and New York; E. & F. N. Spon.

This has been prepared for English rather than American engineers, the information which it contains being of English trades and markets, the lists of societies English, and the calendars essentially English in their arrangement. About one-quarter of the book is filled with tables of weights, measures, etc., addresses of societies, calendars, reports of markets and similar matter; the remainder is occupied by a calendar having a good space for each day in the year, upon which a memorandum record can be kept. This occupies alternate pages, the intervening pages being given up to advertisements. The diary is convenient; but the book is rather too bulky for daily use.

THE WHITNEY CONTRACTING CHILL: BY JOHN R. WHITNEY, PATENTEE. Philadelphia; published by the Author.

This neat little pamphlet is a brief but forcible—and more forcible because brief—presentation of the merits of the contracting chill and the advantages of its use in casting car-wheels. There has been some discussion of the merits of this device, but the question is, perhaps, one best settled by experience and the actual results obtained from wheels cast in contracting chills. There are certainly many arguments in its favor, and a strong one—which is not mentioned in the pamphlet—is that it has been adopted by wheel-makers of such high standing and long experience as the Messrs. Whitney.

## BOOKS RECEIVED.

PROCEEDINGS OF A NATIONAL CONVENTION OF RAILROAD COMMISSIONERS, HELD AT THE OFFICE OF THE INTERSTATE

COMMERCE COMMISSION, WASHINGTON, MAY 28 AND 29, 1890. Washington; issued by the Interstate Commerce Commission.

OCCASIONAL PAPERS OF THE INSTITUTION OF CIVIL ENGINEERS. London, England; published by the Institution. The present installment of these papers includes Telephonic Switching, by Charles Henry Wordingham; Building in Earthquake Countries, by John Milne; Deep Water Quays in the Port of Cork, by Philip Barry; Taking the Temperature of the Cylinder Walls of a Steam Engine at Different Depths in the Metal, by Bryan Donkin; Water Works in China and Japan, by J. W. Hart, James Orange and J. H. T. Turner.

A second installment includes papers on the Action of Quick-sands, by Wilfrid Airy; Concrete Quarters for Native Staff on Indian Railroads, by Thomas Ker; Reclamation of Lake Aboukir, by H. G. Sheppard; Barry Dock Works, by John Robinson; Lough Erne Drainage, by James Price; three papers on bridges—the Hawkesbury Bridge, by C. O. Burgi; the Dufferin Bridge over the Ganges, by F. T. G. Walton, and the Blackfriars Railroad Bridge, by G. E. W. Cruttwell.

PRACTICAL SANITARY AND ECONOMIC COOKING: BY MRS. MARY HINMAN ABEL. THE LOMB PRIZE ESSAY. Published by the American Public Health Association.

REPORTS FROM THE CONSULS OF THE UNITED STATES TO THE STATE DEPARTMENT. No. 115, APRIL, 1890. Washington; Government Printing Office.

EIGHTEENTH ANNUAL REPORT OF THE PENNSYLVANIA COM-PANY, FOR THE YEAR ENDING DECEMBER 31, 1890.

QUARTERLY REPORT OF THE CHIEF OF THE BUREAU OF STATISTICS, TREASURY DEPARTMENT, ON THE IMPORTS, EXPORTS, IMMIGRATION AND NAVIGATION OF THE UNITED STATES, FOR THE THREE MONTHS ENDING MARCH 31, 1890. Washington; Government Printing Office.

THE ECONOMY AND EFFICIENCY OF STEAM HEATING AT ATMOSPHERIC PRESSURE: THE BARNARD VACUUM SYSTEM FOR
HEATING BUILDINGS BY STEAM WITHOUT PRESSURE. New
York; issued by the Barnard Engineering Company.

THE MAYRHOFER ELECTRO-PNEUMATIC SYSTEM FOR DISTRIBUTING STANDARD TIME. New York; issued by the Electro-Pneumatic Time Company.

EFFICIENCY OF CHAIN BLOCKS: REPORT BY PROFESSOR R. H. THURSTON. Stamford, Conn.; issued by the Yale & Towne Manufacturing Company.

CATALOGUE OF THE CINCINNATI CORRUGATING COMPANY, CORRUGATED AND OTHER SHEET METAL BUILDING MATERIAL. ILLUSTRATED. Piqua, Ohio; issued by the Company.

## ABOUT BOOKS AND PERIODICALS.

THE JOURNAL of the Military Service Institution for July has articles on Infantry Battle Tactics, by Captain McClernand; Reform in Army Administration, by Lieutenant-Colonel Lee; Place of the Medical Department, by Lieutenant-Colonel Woodhull; Fifth Corps Ambulance Train in 1864, by Lieutenant-Colonel Drum. There are also a number of translations and reprints of interest, and an historical sketch of the Fourteenth Regiment of Infantry, by Colonel T. M. Anderson.

Among the notable articles in the POPULAR SCIENCE MONTHLY for July are Telpherage in Practical Use, by F. A. Fernald; Meteorites, by Dr. O. W. Huntington; Commercial Geography of South America, by G. G. Chisholm, and Greenland, by Elisée Reclus.

In Scribner's for July, which is a summer number, Mr. Bruce Price's article on the Suburban House will be found exellent reading. The article of the Citizen Series for the month in on the Right of the Citizen to his own Reputation, and is by E. L. Godkin. Surf and Surf Bathing, by D. Osborne, is hardly a scientific article, but will interest a good many at this season.