

The design of the supporting structures or towers, along with the construction methods and various materials employed in connection with many of the American transmission lines, are described at some length, and the many tables and computations incorporated in these chapters are valuable.

Tables are contained in Chapter 6 which are of interest and value to the engineer, and, in fact, to anyone interested or connected with the transmission of electrical energy these tables, giving all the principal data relative to the higher voltage lines throughout the world. There is a slight error in two places in Table 28a, giving the gauge of the Toronto Power Co.'s copper conductors as 198,000 C.M., which, to be correct, should read 190,000 C.M., but before the next edition of the book goes to press this small error may be corrected.

The chapters devoted to wooden poles, concrete poles, steel poles and towers and special structures are all creditable, giving, as they do, all the most approved methods of present-day construction along these lines. In connection with the use of wooden poles, the various methods of impregnation or preservative treatment are described, the relative values of the pressure, open-tank and brush treatments being discussed.

Foundation work receives due consideration, the chapter devoted to same being replete with illustrations showing the most approved practice in this connection; and again, the chapter on erection and costs, and on general specifications, is creditable.

From an operating standpoint the question of insulators is of vital importance, and the relative values of the suspension and pin-types receives consideration.

During the past year some of the larger American companies have introduced some radical changes in the mechanical design of pin-type insulators for higher voltages, and these, we trust, will eliminate, to some extent, the defects that have developed in the past. However, the practical limit of the pin-type, as at present developed, is in the neighborhood of 85,000 volts, as, beyond this voltage, the leverage, caused by the excessive length of pin required, becomes too great, the small amount of porcelain separating pin and conductor solicits puncture, and the weight and manufacturing cost become excessive; therefore, for transmission lines to be operated above 85,000 volts, the suspension type is as yet the only solution of the insulator problem.

In conclusion, it may be said that Mr. Coombs has covered the field in a manner creditable to any writer, and is to be complimented on the arrangement of his subject matter and the general excellence of the photographs selected with which to illustrate his book.

**The Caisson as a New Element in Concrete Dam Construction.**—A proposal made in connection with the Columbia River Power Project. By O. G. Aichel. Published by Spon & Chamberlain, New York. 32 pages, 10 x 7 ins, paper, six folding plates. Price, \$1.00 net.

An essay describing a proposed scheme of construction of a concrete and steel arch dam on the Columbia River, near The Dalles, Oregon. The proposal presents some novel features, the erection of a caisson in tunnel under the river-bed and its subsequent raising being a new method for carrying out work of this nature. The author has eliminated any preliminary studies as to the reasons for adopting the scheme. The proposed method of construction is given with much detail, the work being

divided up into five periods of construction as follows: shaft-sinking and tunnelling; erection of caisson and building of base of dam; excavation of main tunnel chamber; blasting of the roof of the main tunnel chamber; lifting of the caisson and building up of the dam. The essay should be of interest and value to those engaged in the design and construction of large dams.

### **The Metallography and Heat Treatment of Iron and Steel.**

By Albert Sauveur, Professor of Metallurgy and Metallography in Harvard University and the Massachusetts Institute of Technology. Published by Sauveur and Boylston, Cambridge, Mass. 504 pages, 7¼ x 10½ ins., 438 illustrations, cloth. Price, \$6.00 net. (Reviewed by John B. Temple, B.A.Sc., Toronto Iron Works.)

Three years ago the first edition of this educational treatise appeared, and in order to keep abreast with this fast-growing science the author now offers a revised edition which has been almost entirely re-written and presents much new material.

This book will commend itself possibly more to the student or the teacher than to the metallographist, as each chapter is arranged somewhat after the style of a series of lectures dealing with the subject from the ground up. However, the metallographist or engineer who wishes to brush up his knowledge of the subject will find much valuable information condensed in its pages.

The first three chapters deal entirely with the apparatus and manipulation of same for the modern metallographic laboratory. The next two chapters have as their chief object the explanation of the facts and theories regarding crystallization. The more serious work of the book is continued from this point on.

We would possibly advise the reading of the last three chapters first. These deal with the equilibrium diagram, the phase rule, and the nomenclature of microscopic constituents. On account of their complexities, these discussions have been left till the last, but on a clear understanding of these chapters (particularly the equilibrium diagram) hinges the whole subject.

A noteworthy feature of the book is the many excellent photomicrographic illustrations setting forth clearly the structures of iron and steel in their many forms.

Altogether, Mr. Sauveur presents an excellent, well-balanced treatise and covers the subject very thoroughly.

**Oil Fuel Equipment for Locomotives and Principles of Application.** By Alfred H. Gibbings, A.M.Inst. C.E. Published by Constable & Company, Ltd., London. 125 pages, 5½ x 8½ ins., 42 figures and 16 tables, cloth. Price, \$2.00.

This book covers the principles of combustion as applied to oil-burning locomotives. The various methods of burning oil fuel by steam jet; compressed air jet, and pressure jet systems are fully described and the advantages and disadvantages of each are taken up. The pressure jet system is enlarged upon in a whole chapter in which several types are described. Burners, fire-boxes and draughts are studied and their effect upon the efficiency of operation is noted. The proper disposition of the apparatus connected with a pressure jet system is shown, and illustrated on a diagram. The author states that the publication is intended chiefly for the use of locomotive superintendents and others who have the control of railway engines using oil as fuel.

The book deals with its subject in a clear and practical manner and is to be recommended to railroad men and