

The heading of Part D is "Practical Location Surveys." It consists of 105 pages. Chapters 22 to 26 inclusive discuss in order, reconnaissance, the preliminary survey, the location survey, construction surveys, and railroad construction estimates. All of these subjects are covered in a much more thorough manner in books previously published.

Appendix A is a reproduction of the specifications for the formation of the roadway, from the Manual of the American Railway Engineering Association.

In general, the book attempts to cover too broad a field. The topic headings are not numbered and cross-referencing is made cumbersome. The table of contents gives an outline of the data included in each chapter in the place of a complete list of the topic headings.

The Theory and Practice of Working Plans (Forest Organization). By A. B. Recknagel, A.B., M.F., Professor of Forestry, Cornell University. Published by John Wiley & Sons, New York; Canadian selling agents, Renouf Publishing Co., Montreal. Second edition, 1917. 265 pages, 6 plates, $5\frac{3}{4} \times 9$ ins., cloth. Price, \$2.00 net. (Reviewed by B. E. Fernow, University of Toronto, Toronto.)

The subject matter of this volume can have only a limited interest to the general engineer, except as it is useful to study and understand the organization of any business—in this case the business of furnishing the engineer systematically and continually with one of the important materials of construction—a business which as yet is undeveloped in Canada and hardly on the continent, the business of forestry. It comprises the mathematical side of forest organization.

This organization is based on the realization that the forest crop requires many years, 75 to 100 and more, to mature, that the annual growth cannot be directly utilized, and hence needs special arrangements to permit an annual harvest of appropriate amount, based upon the annual increment—to secure what is technically called the "sustained yield." The problem is to change a naturally intermittent business into an annual one.

The forester is fortunate in having formulated an ideal forest, which would fulfil the requirement of the sustained yield, i.e., the yield which will eventually allow an annual or periodic harvest of the increment. This ideal, the so-called "normal forest," is composed of as many stands differing in age as there are years in the rotation—normal age classes—which represent the normal stock on which the normal increment accumulates, and permits an annual cut of mature timber representing the annual forest increment on the whole property.

The art of the organizer and the object of the working plan is to gradually bring the usually abnormal forest into approximately normal conditions in such a manner that the future is provided for without too much sacrifice of present interests.

This is done largely by determining a proper felling budget during the time of the change to normal conditions, and it may take 100 and more years before the object is attained.

There are eighteen different methods described for approaching this problem, mostly developed in Germany, for regulating the cut and securing systematic procedure.

The first chapter is concerned with the method of securing the basis or data for this regulating, which consist of a forest survey, including ascertainment of forest

conditions, stock on hand, increment, actual and normal, yield tables, subdivision of the property, the determination of the rotation, i.e., the felling age or desirable age of harvest, the desirable silvicultural methods, etc.

Some 80 pages are devoted to description of the practices in regard to working plans in Germany and France, Austria, and in America. While in the European countries working plans are really followed, in America, i.e., the United States, the making of working plans is still largely academic discussion. In Canada there is as yet nothing but exploitation of the natural forest without reference to the future and the normal forest; the organization of a continuous business of forest cropping is still only a wish, with little show of realization.

Railway Estimates, Design, Quantities and Costs. By F. Lavis, M.Can.Soc.C.E. Published by the McGraw-Hill Book Co., Inc., New York. First edition, 1917. 608 pages, 99 illustrations, 6×9 ins., cloth. Price, \$5. (Reviewed by G. J. L. Boyd, Creosoted Block Paving Co., C.P.R. Building, Toronto.)

The author has in this book made available in convenient and concise form a vast store of practical information and cost data for engineers called upon to report on the value of, or estimate the probable cost of proposed railways, either before or after surveys have been made,—to estimate the value of existing lines,—to design the general features of a proposed railway or modify the design of an existing line,—to determine the value or utility of such feature of the general design of railways as affect their cost or value as transportation machines.

The work has been prepared by an engineer from his own experience in actual work as well as having had access to the records of many railroads, thus giving an added value to the data.

Under appropriate headings are first given general data, such as preliminary estimates previous to survey, and estimates based on surveys; general costs of complete railroads, etc.; then follows construction methods and costs, including clearing and grubbing, earth and rock excavation, tunnels, masonry, bridges (railway and highway), track and track work, fencing, crossings, section houses, telegraph, signals, shop and yard buildings, stations, etc. Chapter 11 devotes 72 pages to rolling stock, in all its phases, followed by Appendix "A" "General Specifications and Forms of Contract"; Appendix "B," "Appraisal of the Lehigh Valley Railroad"; Appendix "C," "Processes of Timber Preservation"; Appendix "C," "Processes of Timber Preservation"; Appendix "D," "General Railway Statistics," with 31 pages of tables complete an excellent and practical work which should have a place in every consulting and practising engineer's library.

Examples in Battery Engineering. By Prof. F. E. Austin. Published by the author, 1917. 90 pages, 39 illustrations, $4\frac{3}{4} \times 7\frac{3}{4}$ ins., cloth. Price, \$1.25. (Reviewed by E. G. Ernest, general manager, Canadian National Carbon Co., Limited, Toronto.)

This book appears to be concise, accurate and to the point, and covers in a comprehensive way the fundamental principles involved in battery engineering. It should be valuable to engineering students and others who use batteries and to those who sell batteries, in order that they may have the knowledge necessary to give the best possible service.