

# The Engineer's Library

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## BOOK REVIEWS.

**The Design of Railway Location.** By Clement C. Williams, Professor of Railway Engineering, University of Kansas. Published by John Wiley & Sons, Inc., New York; Canadian selling agents, Renouf Publishing Co., Montreal. First edition, 1917. 517 pages, 106 figures, 62 tables, 6 x 9 ins., cloth. Price, \$3.50 net. (Reviewed by Wm. C. Willard, plant engineer, Kilbourne & Jacobs Mfg. Co., Columbus, Ohio, formerly assistant professor of railway engineering, McGill University.)

"The Design of Railway Location," by Clement C. Williams, consists of an introductory chapter and four major parts.

Chapter 1, the introduction, devotes 22 pages to a description of early railroads, their types of track and locomotives, operating conditions, and growth of railway systems. Though interesting to read, this chapter could be condensed to one-third the space without in any way reducing its value. For instance, neither the student nor the practical railroad man is materially benefited by a description of how Horatio Allen—"the first man who took hold of a lever to run a locomotive in America"—settled in his own mind whether to take his first trestle at high speed or low speed. In describing the untimely end of the locomotive, the "Best Friend" of Charleston, the author might have completed the story by tracing back "safety first" to the "barrier car"—a car loaded with bales of cotton and placed immediately back of the locomotive—used by the South Carolina Railroad after the explosion of the "Best Friend," and widely advertised as being a great protection to the passengers when the boiler exploded.

Part A takes up the subject of railway economics and legislation. Chapters 2 and 3 discuss capitalization, incorporation, systems of organization, and legal control of railways. Though the divisional and departmental systems of organization are described, no mention is made of the fact that the organization of most American railways are neither clearly divisional nor clearly departmental.

The vast and complex subject of valuation is covered by Chapter 4 in 18 pages.

The approximate methods of estimating the volume of traffic which a new road may expect to receive are thor-

oughly covered in Chapter 5. This should be supplemented by a statement that the only reliable method of getting a final estimate of the probable volume of traffic is for a traffic expert to make a "house-to-house" field survey of the tributary area.

In Chapter 6 is given a complete list of the 1914 classification of operating expenses as adopted by the Interstate Commerce Commission. Tables are included which give the percentages of the various items of the classification in effect prior to July 1, 1914, for the fiscal year 1914. These would be of greater value if they covered a more extended period. Taxes are briefly referred to in this chapter.

Rates, freight classifications, switching charges, demurrage, c.l. and l.c.l. rates are taken up in Chapter 7, but no mention is made of how little effect the work of the designer of railway location has upon railway rates.

Part B is a discussion of the operating conditions affecting location. It constitutes 179 of the 504 pages and is the most important part of the book. Chapter 8 is a general explanation of locomotive performance. Under "fuel" some mention should be made of pulverized fuel.

Electric traction is discussed in Chapter 9. Because of the growing importance of steam-road electrification no modern book on railway location would be complete without referring to its possibilities.

In Chapter 10 are given weights and dimensions of cars and locomotives, the economy of large cars and locomotives is emphasized, and draft gear and the air brake are described.

Chapters 11 and 12 contain a comprehensive discussion of train resistance, locomotive rating, economic speed of trains, and the location of terminals and sidings.

In Chapters 13, 14 and 15 are discussed grade resistance, ruling grades, value of grade reduction, momentum and minor grades, the velocity or virtual profile, velocity-distance and velocity-time curves, rise-and-fall and its effect upon operating expenses, and pusher grades.

Chapter 16 is a discussion of the effect of distance upon operating expenses. Chapter 17 deals with curvature, its limiting effect upon tonnage and speed, its effect upon operating expenses, and its compensation. Twenty-one pages are devoted to curvature while but 12 pages are allowed for distance.

Part C, consisting of 73 pages, deals with special problems in railway location. Line changes and grade reduction are taken up in Chapter 18; the elimination of grade crossings is discussed in Chapter 19, and the maximum capacity of single track and the necessity for additional tracks are covered in a satisfactory manner in Chapter 20. These three chapters cover matters not heretofore included in books of this nature and are a valuable addition.

Chapter 21 discusses briefly the location of electric interurban railways. The problems arising in the location of electric railways are quite different from those of steam-railway location, and might well be left for a book dealing entirely with electric railways.