Solution of Railroad Problems By The Slide Rule, E. R. Cary, D. Van Nostrand Company, 1913

The author was a professor of Railroad Engineering and Geology at Rensselaer Polytechnic Institute in New York, where he developed a series of problems for use in his classrooms. As stated in its Preface, the purpose of this text is to provide similar exercises for students who have already studied Railroad Curves and the Theory of the Slide Rule. These statements, the small (pocket) size of this hard-backed book, the brevity (or lack) of discussion or explanation of the problems involved, and the overly specific instructions as to how the rule should be manipulated in solving problems, suggest that the text was intended as a reference work for individual, not classroom, use, and by individuals at higher University levels who have already studied the theory of the slide rule and the mathematics required in the problems discussed.

No theory is presented in this text, either concerning the slide rule or the problems described. A very brief (3 ½ pages) explanation of how to solve simple algebraic expressions is provided. The problems are all applied geometrical/trigonometrical types associated with railway design and construction. In the problems discussd, despite the prior inferences that the reader is expected to be familiar with how to use a slide rule, very specific and detailed instructions are provided as to how the rule should be manipulated, i.e., to what point on a scale the index should be moved, how the ‘runner’ should then be positioned, how next to move the slide, how to invert the slide for the handling of reciprocals, etc.

In all cases, a Mannheim-type rule is assumed, with a scale layout of A, B, C, D and trig scales on the slide reverse. No specific rules or manufacturers are discussed.

Tables presented in the text include: Deflection Angles for Spirals, Constants, Formulae for Triangles, Trigonometric Formulae, Trigonometric Series, Simple Curve Formulae, Vertical Curve Formulae, Turnout Formulae, Spiral Formulae, and Earthwork Formulae. The text contains no index, but this is no deficit because of the way the Table of Contents is constructed. The TOC lists separately the areas for study, the problems in each area, and the tables and diagrams included. This text would seem to be a good reference work and should serve as an excellent refresher for those who have already studied this type of material. It’s also a great overview for those of us who’ve never paid much attention to the types of problems required in railway design.

Steve K. Seale, 2019