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variations, and incidentally may give many of them a taste for some of the more abstract considerations.

The basic equations of the theory, both relating to existence and uniqueness, and to the specific properties of the solutions of variational problems, are clearly disclosed, and followed by a description of more general topics such as fields, parametric forms, and strong and weak extrema. Generalizations of the fundamental problems, such as variable end points, higher-order derivatives, and discontinuous solutions are then considered. The last chapter deals with direct methods relating both to existence questions and to computational methods.

A lengthy appendix consists of a number of exercises with solutions, or hints for solution, together with illustrations of the application of some of the important theorems.

The translation, format, and typography are good, and there are very few misprints. This book is a welcome addition to the field and should be useful to a great variety of readers.

Integrals of Bessel Functions. By Yudell L. Luke. 424 pp. McGraw-Hill Book Co., Inc., New York, 1962. \$12.50. Reviewed by J. Gillis, Weizmann Institute of Science.

TO many mathematicians, Watson's *Bessel Functions* has represented, for forty years now, the revealed word on the subject. Indeed, the critical erudition, mathematical power, and literary skill which went into that work will long make it a model of what a mathematics book ought to be. But it happens often in science that the revealed word is not the last one, and the book under review ends with a huge bibliography, all post-1922 and nearly all post-1941.

The amount of information in this newest compendium is impressive. Hardly any proofs are given though the main ideas are occasionally sketched in. The author has contrived to avoid chaos by treating Bessel functions as special cases of generalized hypergeometric functions, and this idea provides some sort of guiding line through the mass of formulae. Most of the results quoted relate to indefinite integrals. Volume 2 of Erdelyi's *Higher Transcendental Functions* contains a large number of definite integral formulae but comparatively few indefinite, and so we must be grateful for this new selection.

There is a useful section on polynomial approximations to various Bessel functions with real arguments; and the chapter on rational approximations to the incomplete gamma function is based largely on the author's own researches.

It is perhaps not surprising that many of the more recent references in the bibliography are to numerical evaluations and tables, since that reflects the age in which we live. In any case, the reference list of tables, etc., is particularly complete and is not the least useful feature of this work.