The book should serve very well in promoting a general knowledge of radar techniques and thus permitting these techniques to receive widespread application in a peacetime world.

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Lectures on the calculus of variations. Gilbert A. Bliss. Chicago: Univ. Chicago Press, 1946. Pp. ix + 296. $5.00.

This book, written by a mathematician who exerted a profound influence upon the modern development of calculus of variations, represents a most significant addition to textbook literature on the highest level. It contains both the fundamentals of the theory and a judicious selection of advanced results. In particular, it contains an integrated exposition of the many significant results that were obtained by the author and his pupils in the problem of Bolza over a period of years.

The book is divided into two parts. Part I, on the simpler problems of the calculus of variations, is concerned with problems in three-space of a relatively elementary character and is comprised of six chapters, as follows: "The Calculus of Variations in Three-Space"; "Sufficient Conditions for a Minimum"; "Fields and the Hamilton-Jacobi Theory"; "Problems in the Plane and in Higher Spaces"; "Problems in Parametric Form"; and "Problems With Variable End-Points." Part II, on the problem of Bolza, is subdivided into the following chapters: "The Multiplier Rule"; "Further Necessary Conditions for a Minimum"; and "Sufficient Conditions for a Minimum." The appendix which follows gives an excellent exposition of the existence theorems for implicit functions and for differential equations that are needed in the theory. The bibliography contains 77 titles, many of which represent the work of members of the Chicago school.

Even though moderate in size, the book contains a very complete account of the field covered. The exposition is uniformly excellent. The decision of the author to begin with a development of the theory in three-space is a wise one. The plane case is deceptively simple in many ways and, as a first study, is unsuited to prepare the reader for the phenomena that arise in the general case. The restriction to simple integral problems is justified, perhaps, for the opposite reason. Indeed, double integral problems present so many distressing features that the enthusiasm of the beginner may not survive the initial shock. Analogous remarks apply to various other topics that are not discussed in detail in the book. The so-called direct method, for example, involves an excessive amount of the general theory of functions of real variables, and the specific features that make calculus of variations such a fascinating study may become obscured thereby in a first introduction to the field. In view of the fact that the author contributed a beautiful study of several important special problems in an earlier volume (*Calculus of variations,* in the Carus monograph series), the lack of applications in the present volume is also justified, even though the reviewer had welcomed some further detailed studies of classical variation problems (for example, the isoperimetric problem on surfaces of constant curvature).

The reviewer feels that the book fills a very definite need in a very admirable manner. It is indispensable for those who wish to study or teach the subject.

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Scientific Book Register

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