THESES ON CALCULUS OF VARIATIONS, 1931–32

Contributions to the Calculus of Variations, 1931–1932. Theses submitted to the Department of Mathematics at the University of Chicago. University of Chicago Press, February, 1933. 523 pp.

The present volume, uniform in appearance with the one published under similar title in 1930 (reviewed in this Bulletin, vol. 38 (1932), p. 617), contains eight doctoral dissertations, one master's thesis (No. 10 below), and an article (No. 6 below), written in pursuit of unalloyed scientific interest, rather than "submitted in candidacy for" a degree. It is gratifying to observe that the reception accorded the frankly experimental "contributions" of 1930 was sufficiently enthusiastic to justify a continuation of the venture. In size, in proof reading, in general appearance, this volume surpasses its predecessor; in significance of content it also marks an advance. In the preface, signed by Professors Bliss and Graves, under whose direction the theses contained in the volume were written, it is pointed out that one of the advantages of this form of publication of doctoral theses is that it makes it possible to give "the candidate for the Ph.D. degree as much freedom in his writing as is consistent with mathematical accuracy and clearness of style, even if the result is more verbose than could reasonably be approved for publication in a journal." It is therefore to be understood that the volume has not been edited, that each author is responsible for his own paper only, and that the book is to be looked upon as a collection of individual papers, linked together only in so far as their subjects are related, and by the incidental fact that they all represent work done by the Department of Mathematics of the University of Chicago.

The book consists of ten parts:

1. *Edge conditions for multiple integrals in the calculus of variations*, by J. E. Powell, (pp. 1–62).

2. *The Euler-Lagrange multiplier rule for double integrals*, by M. Coral, (pp. 63–94).

3. *The condition of Mayer for discontinuous solutions of the Lagrange problem*, by R. A. Hefner, (pp. 95–130).

4. *A problem in the calculus of variations suggested by a problem in economics*, by H. H. Pixley, (pp. 131–190).

5. *Functions of lines and the calculus of variations*, by R. G. Sanger, (pp. 191–294).

6. *Sufficient conditions for a problem of Mayer in the calculus of variations*, by G. A. Bliss and M. R. Hesteness, (pp. 295–338).

7. *Sufficient conditions for the general problem of Mayer with variable endpoints*, by M. R. Hestenes, (pp. 339–360).

8. *The problem of Bolza and its accessory boundary value problem*, by Kuen-Sen Hu, (pp. 361–444).

9. *Jacobi's condition for multiple integral problems of the calculus of variations*, by A. W. Raab, (pp. 445–474).

10. *A history of the classical isoperimetric problem*, by T. I. Porter, (pp. 475–523).