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(b. Chicago, Illinois, 9 May 1876; d. Harvey, Illinois, 8 May 1961)

mathematics.

Gilbert Ames Bliss, the son of [George Harrison Bliss](#) and Mary Maria Gilbert, devoted his life to the study of mathematics. Although his scientific interests ranged broadly over the field of analysis, with special emphasis on the basic existence theorems, the focal point of much of his work was the calculus of variations. Prior to [World War I](#) he wrote, with Max Mason and A. L. Underhill, on the application of the methods of Weierstrass to a number of problems in the latter subject. He worked in the ballistic laboratory at Aberdeen, Maryland, during the war, and used his knowledge of the calculus of variations to construct new firing tables. In the 1920's, his papers encompassed the transformation of Clebsch, proofs of the necessity of the Jacobi condition, multiple integrals, and boundary value problems in his field.

His elementary Carus Monograph on the calculus of variations (1925) was followed, after some twenty years, by his definitive book: *Lectures on the Calculus of Variations* (1946). In this publication Bliss employed the scattered results of mathematicians of past decades, many of whom were his former students, to establish firmly the theoretical foundations of the calculus of variations. He approached his subject from the viewpoint of analysis and covered the use of existence theorems for implicit functions, differential equations, and the analysis of singular points for the transformations of the plane. He improved upon and extended the theories of the problems of Lagrange, Mayer, and Bolza and simplified the proofs of the necessary and sufficient conditions of these problems. He clearly presented the theory of the calculus of variations for cases involving no side conditions. Overall he gave a greater comprehensiveness and generality to the field than had previously existed. As a result of his earlier work as summarized in this book, Bliss may be judged one of the chief architects of the edifice of the calculus of variations.

Bliss's work represents a turning point in American mathematics. With his generation, American mathematics came of age. Previously, most American mathematicians had received their training in, and inspiration from, Europe. From the beginning of his career, Bliss was identified with the [University of Chicago](#). He enrolled there in 1893, one year after the university opened its doors. He received his bachelor's degree in 1897, his master's in 1898, and his doctorate in 1900. Although he began his studies in mathematical astronomy, under the guidance of F. R. Moulton, he soon turned to the study of pure mathematics. E. H. Moore, Oskar Bolza— who aroused his interest in the calculus of variations— and H. Maschke were his instructors.

Bliss spent his apprenticeship as a mathematics instructor at the universities of Minnesota (1900–1902) and Chicago (1903–1904). From 1902 to 1903 he did postgraduate work at the University of Göttingen. Bliss was assistant professor of mathematics at the University of Missouri (1904–1905) and at Princeton (1905–1908). In 1908 he returned to Chicago as an associate professor.

On 15 June 1912, Bliss married Helen Hurd (d. 1918). They had two children, Elizabeth and Gilbert, Jr. He married Olive Hunter 12 October 1920.

Bliss taught and worked at the [University of Chicago](#) from 1908 to 1941. He was associate professor until 1913, professor from 1913 to 1941, and professor emeritus from 1941. He succeeded Moore as chairman of the mathematics department in 1927 and was Martin A. Ryerson distinguished professor of mathematics from 1933 to 1941. Throughout his career at Chicago he was known for his lively sense of humor and for stressing the importance of a strong union between teaching and fundamental mathematical research.

From 1909 until his death, Bliss exerted a strong influence on the American mathematical scene. He was an associate editor of the *Transactions of the American Mathematical Society* from 1909 to 1916, and from 1921 to 1922 was president of the society. He was elected to the [National Academy of Sciences](#) in 1916, and in 1924, with G.D. Birkhoff and Oswald Veblen, he became a member of the awards committee of the newly instituted National Research Fellowships in mathematics. Bliss served on this committee until 1936. In 1925 he received the first Chauvenet Prize awarded by the Mathematical Association of America for his paper "Algebraic Functions and Their Divisors". The following year Bliss was elected a member of the [American Philosophical Society](#). In 1935 he was made a fellow of the [American Academy of Arts and Sciences](#). For many years Bliss served as chairman of the editorial committee established by the Mathematical Association of America for its Carus Monographs, a series of short expository books on mathematics for the layman.

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Bliss also wrote many articles: "The Geodesic Lines on the Anchor Ring" (doctoral dissertation), in *Annals of Mathematics*, **4** (1902), 1–21; "The Solutions of differential Equations of the first Order as Functions of Their Initial Values," *ibid.*, **6** (1905), 49–68; "A Problem of the Calculus of Variations in Which the Integrand Is Discontinuous," in *Transactions of the American Mathematical Society*, **7** (1906), 325–336, written with Max Mason; "A New Proof of Weierstrass' Theorem Concerning the Factorization of a Power Series," in *Bulletin of the American Mathematical Society*, **9** (1910), 356–359; "Generalizations of Geodesic Curvatures and a Theorem of Gauss Concerning Geodesic Triangles," in *American Journal of Mathematics*, **37** (1914), 1–18; "A Note on the Problem of Lagrange in the Calculus of Variations," in *Bulletin of the American Mathematical Society*, **22** (1916), 220–225; "Integral of Lebesgue," *ibid.*, **24** (1917), 1–47; "Solutions of Differential Equations as Functions of the Constants of Integration," *ibid.*, **25** (1918), 15–26; "The Problem of Mayer With Variable End Points," in *Transactions of the American Mathematical Society*, **19** (1918), 305–314; "Functions of Lines in Ballistics," *ibid.*, **21** (1920), 93–106; "Algebraic Functions and Their Divisors," in *Annals of Mathematics*, **26** (1924), 95–124; "The Transformation of Clebsch in the Calculus of Variations," in *Proceedings of the International Congress of 1924 at Toronto*, **1** (1928), 589–603; "The Problem of Lagrange in the Calculus of Variations," in *American Journal of Mathematics*, **52** (1930), 673–744; "The Problem of Bolza in the Calculus of Variations," in *Annals of Mathematics*, **33** (1932), 261–274; "Mathematical Interpretations of Geometrical and Physical Phenomena," in *American Mathematical Monthly*, **40** (1933), 472–480; "The Calculus of Variations for Multiple Integrals," *ibid.*, **49** (1942), 77–89.

II. Secondary Literature. Articles on Bliss are L. M. Graves, "Gilbert Ames Bliss, 1876–1951," in *Bulletin of the American Mathematical Society*, **58** (1952), 251–264 (this article contains a bibliography of Bliss's publications); and Saunders MacLane, "Gilbert Ames Bliss (1876–1951)," in *Yearbook of the American Philosophical Society* for 1951, pp. 288–291.

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