MADDISON, Isabel. April 13, 1869–October 22, 1950.
University of London (BSc 1893), Bryn Mawr College (PhD 1896), Trinity College (Dublin) (BA 1905).

Ada Isabel Maddison was born in Whitehaven, a seaport town in Cumberland, the most northwestern county in England. She was the daughter of Mary Jane (Anderson), born in about 1829 in Ireland, and John Maddison, born in about 1826 in Durham, England. Her father was a civil servant. British census records indicate that Isabel Maddison was probably the youngest of four children. The others were Anne (b. 1853), Jane (b. 1854), and William Thomas (b. ca. 1859). In 1871 the family was living in Whitehaven, where it appears that John Maddison was a parish supervisor, and in 1881 they were in Cardiff, Wales, where her father was an internal revenue collector. In 1891 Isabel Maddison and her sister Annie were in Bristol, England, with their brother, William T., a registered medical practitioner.

After attending Miss Tallies School in Cardiff, in June 1885 Isabel Maddison passed the matriculation examination at the University of London (an examining body only and not a teaching institution at that time). She then entered the University College of South Wales and Monmouthshire in Cardiff and passed the University of London intermediate science examination in 1887. She remained until 1889 but did not earn a degree from University College, Cardiff, since it did not grant degrees at that time.

In 1889 Maddison went to Girton College in Cambridge on a scholarship given by the Clothworkers' Guild. With another first-year student, Grace Chisholm, she obtained permission to sit in on Arthur Cayley's lectures at Cambridge. In the beginning, her tutor at Girton was William Henry Young, who would marry Grace Chisholm in 1896. Chisholm later wrote that for Maddison "a high place in Tripos was worth 'bread and butter and dresses and hats' " (Grattan-Guinness 1972, 118). Thus, Chisholm, who believed her own tutor, Arthur Berry, superior to Young, convinced Maddison to share her tutorial the following year. Maddison and Chisholm took all their examinations at the same time; Maddison scored slightly better than Chisholm the first two years. At the end of the third year when they sat for Part I of the Tripos in spring 1892, their placement was reversed; both earned first class with Maddison equal to the twenty-seventh Wrangler. They both then unofficially sat for the Oxford Final Honours School in mathematics, the first women to do so. Chisholm remained another year at Girton and then went to Göttingen to become, with Mary Winston (Newson), one of the first three women to formally attend lectures and participate in the seminars there.

In 1892 Isabel Maddison came to Bryn Mawr College as a graduate student where she studied mathematics and practical physics. During that year she did work in singular solutions of differential equations and in 1893 published a paper in the British *Quarterly Journal of Pure and Applied Mathematics* on families of curves. Also in 1893, the University of London conferred a BSc with honours on her. According to the college archivist of Imperial College, London, she was "joint second highest in maths for that year [and] tuition was from University College Cardiff, Girton (Cambridge), and Bryn Mawr. . . ." During 1893–94, her second year at Bryn Mawr, she was a fellow in mathematics, and in April 1894 was awarded Bryn Mawr's first Mary E. Garrett European fellowship. Charlotte A. Scott, in writing to Felix

Klein asking that Maddison be admitted to the university at Göttingen, referred to her as "one of my best students." She also remarked, "When she first came to Bryn Mawr, she was, in my opinion, suffering from the effects of overtraining during her seven years of undergraduate life . . . . But her mind soon recovered its elasticity, and my opinion of her ability has increased steadily" (Universitätsarchiv Göttingen).

Maddison spent the year 1894–95 in Göttingen studying with Klein and David Hilbert, among others. The following year she was assistant secretary to M. Carey Thomas, the president of Bryn Mawr. At the end of that year she was awarded her PhD with a dissertation written under the direction of Scott in the area she first studied at Bryn Mawr, singular solutions of differential equations. For her doctorate she was examined in the fields of pure and applied mathematics and in physics. During the year 1895–96 Maddison prepared a translation of an 1895 address by Felix Klein to the Royal Academy of Sciences of Göttingen, which appeared in the *Bulletin* of the AMS.

From 1896 to 1904 Maddison served as secretary to President Thomas and as reader in mathematics. In 1904 her administrative position changed to assistant to the president, while in 1906 her departmental position changed to associate in mathematics. She remained in her dual departmental, administrative positions until 1910 at which time she became recording dean and assistant to the president, remaining in these positions until she retired in 1926. For at least a short period of time, Maddison lived with Charlotte Scott and Scott's cousin.

Although Maddison remained at Bryn Mawr her entire career, the only time she was an active participant in the Bryn Mawr Mathematics Journal Club that started in 1896 was during its first year when she spoke on "Curves which cover an area of the plane." During her years as secretary to the president, Maddison compiled information for handbooks of universities open to women and for a statistical study of women college graduates. She also is listed as author on several Bryn Mawr alumnae registers. Soon after receiving her doctorate she published a number of book reviews in the *Bulletin* of the AMS as well as a short note on the history of map-coloring problems.

According to the Bryn Mawr alumnae office, "in 1905 [Maddison] obtained leave to study at Trinity College, Dublin, where she received a B.A. degree" (Williams Papers). The University of Dublin, as it was also called, does not have a record of her studying there. According to the university's information office, Maddison "had the B.A. degree conferred on her by this University in 1905. She did not, however, study at the University but had completed the necessary exercises at the University of Cambridge to entitle her to have this degree conferred" (Williams Papers).

Isabel Maddison lived in Bryn Mawr most of the time she was associated with the college. She made a trip to England nearly every summer. During World War I, she contributed to the war effort. One summer she did secretarial work for the Woman's Committee of National Defense; another summer she did statistical work for the American Shipping Board. She and her older sister Janie sailed from England to New York in September 1925, before her retirement in 1926. At that time, she indicated that she lived in Wayne, Pennsylvania, near Bryn Mawr. In the October 1928 AMS membership list, she used an address of The Croft, Martin's Dam, Wayne, which apparently was where she lived the rest of her life. She and her sister also made a trip from England to New York in April 1929, and her sister was listed as living with her in the 1930 census.

Although Maddison spent her last years in Pennsylvania, she maintained her identification with the country of her birth as a member of the London Mathematical Society and of the Daughters of the British Empire. She died in her home in Wayne at age eighty-one in 1950. "In her will she bequeathed $10,000 to Bryn Mawr in memory of M. Carey Thomas for use as a pension fund for nonfaculty staff members" (Tattersall and McMurran 1999, 301–2).

Organizational affiliations: AMS, London Math. Soc.

Dissertation:

1896a On singular solutions of differential equations of the first order in two variables and the geometrical properties of certain invariants and covariants of their complete primitives. PhD dissertation, Bryn Mawr College, directed by Charlotte Angas Scott. Printed, 1896, Longmans, Green & Co., London, reprinted from Quart. J. Pure Appl. Math. 28:311–74.

Publications:

1893 Certain factors of the c- and p-discriminants and their relation to fixed points on the family of curves. *Quart. J. Pure Appl. Math.* 26:307–21. Reviews: *JFM* 25.1087.01 (F. Meyer); *Rev. semestr. publ. math.* 3, pt. 1: 96 (W. Mantel).

1896a (Translator from the German) The arithmetizing of mathematics, by Felix Klein. *Bull. Amer. Math. Soc.* 2:241–49.

1896b *Handbook of Courses Open to Women in British, Continental, and Canadian Universities.* New York: Macmillan. Supplement: New York: Macmillan, 1897. Second ed.: *Handbook of British, Continental, and Canadian Universities, With Special Mention of the Courses Open to Women.* Compiled for the Graduate Club of Bryn Mawr College. NY: Macmillan, 1899. Review of 2nd ed.: *School Rev.* 7:508. Supplement to 2nd ed.: Bryn Mawr College, 1901. Second ed. also available on-line at Early Canadiana Online.

1896c On singular solutions of differential equations of the first order in two variables and the geometrical properties of certain invariants and covariants of their complete primitives. *Quart. J. Pure Appl. Math.* 28:311–74. Published version of PhD dissertation. Reviews: *Bull. des sci. math.* 2nd ser., 22:114–16 (J. Tannery); *JFM* 27.0240.03 (M. Hamburger); *Rev. semestr. publ. math.* 5, pt. 2: 97 (W. Mantel).

1897a Note on the history of the map-coloring problems. *Bull. Amer. Math. Soc.* 3:257. Reviews: *JFM* 28.0043.03 (E. Lampe); *Rev. semestr. publ. math.* 6, pt. 1: 4 (D. J. Korteweg).

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1898 Review of *Analytic Geometry for Technical Schools and Colleges*, by P. A. Lambert. *Bull. Amer. Math. Soc.* 4:234–35.

1899 Review of *Jacob Steiner's Vorlesungen über synthetische Geometrie. Zweiter Teil: Die Theorie de Kegelschnitte Gestützt auf projective Eigenschaften*, edited by J. Schröter and R. Sturm. *Bull. Amer. Math. Soc.* 6:113–15.

1917 *A Preliminary Statistical Study of Certain Women College Graduates: Dealing with the Health, Marriage, Children, Occupations of Women Graduating between 1869 and 1898 and Their Sisters and Brothers.* Compiled from information collected for the Association of Collegiate Alumnae in 1900. Bryn Mawr: Association of Collegiate Alumnae.

1932 Charlotte Angas Scott: An appreciation. *Bryn Mawr Alumnae Bull.* 12 (Jan): 9–12.

References to: AmMSc 1–8, AmNatBi, AmWomSc, BiDWSci, BioWMath, ConAu 169, MacTutor, NotMat, NotSci 2, NotTwCS 1S, NotWoSc, Poggendorff 4, WhoEast 1930, WomScSearch, WomWWA.

"Ex-Dean I. Maddison, Long at Bryn Mawr." (Obituary) *New York Times*, 24 Oct 1950.

Whitman, Betsey S. "Ada Isabel Maddison (1869–1950)." In *Women of Mathematics: A Biobibliographic Sourcebook*, eds. Louise S. Grinstein and Paul J. Campbell, 144–46. Westport, CT: Greenwood Press, 1987.
Tattersall, James J. and Shawnee L. McMurran, "Maddison, Isabel." In *American National Biography*, 14:301–2. New York: Oxford University Press, 1999.

Other sources: PhD dissertation life; Owens questionnaire 1937; Williams Papers; Bryn Mawr College Archives; Universitätsarchiv Göttingen, Niedersächische Staats- und Universitätsbibliothek; communication with Imperial College, London, archivist; Ivor Grattan-Guinness, "A Mathematical Union: William Henry and Grace Chisholm Young," *Ann. Sci.* 29 (1972): 105–86; Grinstein, "Some 'Forgotten" Women of Mathematics"; Whitman, "Women in the American Mathematical Society before 1900," pt. 2; P. C. Kenschaft, "Charlotte Angas Scott, 1858–1931," *College Math. J.* 18 (1987): 98-110; England Census 1871, 1891; Wales Census 1881; US Census 1900, 1910, 1920, 1930 PA.

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