GRAY, Marion C. March 26, 1902–September 16, 1979.
University of Edinburgh (MA 1922), Bryn Mawr College (PhD 1926).

Marion Cameron Gray was born in Ayr, Scotland, the daughter of Marion (Cameron) and James Gray. She attended Ayr Grammar School (1907–13) and Ayr Academy (1913–19) before matriculating at the University of Edinburgh in 1919. At the time of her matriculation she indicated that she was a member of the United Free Church of Scotland.

In 1922 Gray received her master's degree, the first degree given in universities in Scotland at that time, with first class honors in mathematics and natural philosophy. She remained at Edinburgh another two years as a post-graduate student in mathematics. While at Edinburgh she studied with E. T. Whittaker, whom she credited with first arousing her interest in mathematics.

Gray came to the United States in 1924 to study at Bryn Mawr College. At Bryn Mawr she held a British graduate scholarship and a Carnegie research scholarship. While at Bryn Mawr, she studied with Anna Pell Wheeler, David V. Widder, Marguerite Lehr in mathematics and James Barnes in physics before receiving her PhD in 1926 having written a dissertation in analysis and with allied subject physics. In December 1925, Barnes had written a letter of recommendation to the president of the University of Saskatchewan indicating that Gray was hoping to remain in the United States or Canada.

After receiving her doctorate, Gray returned to Great Britain, where she was a university assistant in natural philosophy at the the University of Edinburgh for one year and an assistant in mathematics at the Imperial College of Science in London for three years.

In 1930 she returned to the United States and was hired as an assistant engineer in the development and research department of American Telephone and Telegraph Company. She published two papers relevant to her work in the journal *Physics*, later to become the *Journal of Applied Physics*. In about 1932 she discovered what has become known as the Gray graph while "looking for what we called completely symmetric networks" (Gray to Bouwer, July 10, 1969). Although she never published anything about this graph, Izak Z. Bouwer learned of her work on the graph and mentioned it in his 1968 paper "An edge but not vertex transitive cubic graph" (*Canad. Math. Bull.* 11:533–35). In June 1969, he wrote to Gray of his "appreciation of the fact that at a time when graph theory was almost nonexistent, you had already found this graph with its interesting properties." The graph is discussed in "Gray Graph" from Wolfram MathWorld by Eric W. Weisstein, and in "Gray Graph" from Wikipedia, The Free Encyclopedia.

In 1934 she joined the technical staff of Bell Telephone Laboratories where she worked for more than thirty years, first in New York City and then in Murray Hill, New Jersey. While there, Gray published several more articles and contributed to the field of mathematical physics in other ways as well. In addition to writing book reviews in journals, she aided other authors and was acknowledged for her helpful discussions and for her computations. She also wrote 258 reviews in the first fourteen volumes of *Mathematical Reviews*. In 1954 Gray served on an ad hoc committee formed when the National Science Foundation asked the National Bureau of Standards (now the National Institute of Standards and Technology) to prepare a handbook of mathematical tables. The outcome of that project was the

Handbook of Mathematical Functions with Formulas, Graphs, and Mathematical Tables published in 1964. For her entry in the twelfth edition of *American Men and Women of Science*, she indicated her research interests as wave propagation over the spherical earth, mathematical theory of antenna radiation, propagation of waves in loaded wave guides, and numerical analysis. One hundred forty of her reviews in *MR* were classified as "optics, electromagnetic theory, circuits," while another 52 were classified as "special functions."

In the 1930s, Gray lived in New York City and later in East Orange, New Jersey. She became a naturalized United States citizen in 1937. After her retirement in 1967, Gray returned to Edinburgh, where she died at age seventy-seven in 1979.

Organizational affiliations: AMS, MAA, Edinburgh Math. Soc., London Math. Soc., AAAS, IEEE.

Dissertation:

1926 A boundary value problem of ordinary self-adjoint differential equations with singularities. PhD dissertation, Bryn Mawr College, directed by Anna Pell Wheeler. Typescript with manuscript addenda. Printed version, 1928, reprinted from *Amer. J. Math.* 50:431–58.

Publications:

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1953b Review of *Electromagnetic Theory*, by O. Heaviside. *Scripta Math.* 19:158–60.
1961 Bessel functions of integral order and complex argument. *Comm. ACM* 4:169.

References to: AmMSc 5–8, 9–11P; AmMWSc 12P; MacTutor.

Other sources: PhD dissertation vita 1928; Owens questionnaire 1937; application for US social security account number 1936; correspondence between Gray and I. Z. Bouwer 1968–69; correspondence between author and I. Z. Bouwer 2006; Bryn Mawr College Archives; University of Edinburgh Special Collections; University of Saskatchewan Archives; communication with Bryn Mawr College Special Collections Librarian.

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