

BROWN, Eleanor (Pairman). June 8, 1896-September 14, 1973. University of Edinburgh (MA 1917), Radcliffe College (PhD 1922).

Eleanor Pairman was born in Broomieknowe, Lasswade, in the parish of Cockpen, Midlothian, Scotland, the youngest of four daughters of Helen (Dunlop) (b. ca. 1858) and John Pairman (b. ca. 1854), solicitor, Supreme Courts of Scotland. Her parents married in Edinburgh on July 1, 1886. Her father died when she was quite young, apparently before 1901, leaving her mother with few resources to raise her family. Eleanor's sisters were Maxwell (Maxie) (b. ca. 1888), Margaret (Madge) (b. ca. 1890), and Adeline (Aline) (b. ca. 1891); they did not marry. According to information supplied by John Pairman Brown, Eleanor's eldest son, Maxie taught at a boarding school in England; Madge was proprietor of a tea shop, "The Ancient Grudge," northeast of Edinburgh; and Aline did some baby minding and kept the Pairman family home in Broomieknowe. Eleanor was known as Nora by her family.

Nora Pairman attended Lasswade Higher Grade School 1903-08 and George Watson's Ladies' College 1908-14 before enrolling in the University of Edinburgh. Three years later, in 1917, she received her MA with first class honours in mathematics and natural philosophy. At that time the master's degree was the first degree given in universities in Scotland. The year she received her master's degree, she was awarded the Vans Dunlop scholarship in mathematics, a three-year scholarship, awarded by competitive examination, which could be used for study at any university. It was awarded for " 'distinguished proficiency' in the various subjects of competition as determined by the Examiners and the Senatus Academicus" (Edinburgh University Calendar 1917-1918, 269). Pairman continued her studies as a graduate student in mathematics at the University of Edinburgh 1917-18.

Eleanor Pairman read two papers at meetings of the Edinburgh Mathematical Society early in 1918. On February 4, 1918, Cargill G. Knott, then president of the society and one of Pairman's instructors at Edinburgh, wrote a letter of recommendation to the dean of Radcliffe College in Massachusetts. He indicated that Pairman intended to continue her studies at Radcliffe. He wrote:

Throughout her career as an undergraduate Miss Pairman's exceptional mathematical abilities were in strong evidence. Although her natural inclinations were towards Pure Mathematics, she easily mastered the Principles and Methods of Applied Mathematics, and gained the Medal in both my Honours Classes in Dynamics and Hydrodynamics, and this among a group of students of marked ability. Miss Pairman also attended a short course I give on Hamiltonian Quaternions with Physical Applications, and there I was impressed with her capacity for appreciating the theoretical foundations of the calculus.

Very rarely indeed have we had the good fortune of teaching a student with such a strong predilection for mathematical study as Miss Pairman undoubtedly possesses. With fitting opportunity she has every promise of a distinguished and useful career. (Letter provided to author by John Pairman Brown)

During 1918-19 Pairman was a graduate student in applied statistics at the University of London and joined the staff of Karl Pearson's laboratory in the Department of Applied Statistics at University College London. In 1919 they published an article in *Biometrika*, a journal that Pearson edited. In the same issue in which their article appeared, Pearson published an editorial, "Peccavimus! [We have sinned!]," in which he corrected a previous article and noted, "As the problem is an exceedingly important one the writer asked Miss Eleanor Pairman to revise his work. . . . This she has done with certain additions and expansions" (12:267). Also in 1919, Pairman produced the first volume of tables in the *Tracts for Computers* series edited by Pearson.

At about the same time, Karl Pearson wrote to the United States consul in London indicating that Pairman had been granted a scholarship at Radcliffe College, noting that he had done what he could to obtain a passport for her, and requesting that she be admitted to the United States. Eleanor Pairman arrived in New York from London on October 12, 1919, to begin her studies at Radcliffe College. She finished her dissertation in analysis under the direction of G. D. Birkhoff in the fall of 1921 and received her doctorate from Radcliffe College in 1922. She was the third of nine women to receive a doctorate in mathematics from Radcliffe before 1940.

On August 10, 1922, Eleanor Pairman and Bancroft Huntington Brown, a fellow graduate student, were married at Roselea, the Pairman home in Broomieknowe, Scotland. B. H. Brown was born on November 11, 1894, in Hyde Park, Massachusetts, and received a bachelor's degree in 1916 and a master's degree in 1917 from Brown University. B. H. Brown served in the US Army 1917-19; an article by Fenster, Kent, and Archibald notes that he was discharged in order to teach at Harvard University, where mathematics instructors were urgently needed. He served as instructor 1919-21 and continued his graduate work in mathematics there. He received his doctorate in June 1922, the same time as Eleanor Pairman.

After receiving their doctorates, Bancroft and Nora Brown moved to Hanover, New Hampshire, where B. H. Brown joined the faculty of Dartmouth College, then a men's school with an all-male faculty that had occasionally admitted women as graduate students. He remained at Dartmouth his entire career; he was an instructor 1922-24, assistant professor 1924-31, professor 1931-46, and B. P. Cheney professor until his retirement in 1962. He was director of the Navy V-12 mathematics training program at Dartmouth 1943-45.

The Browns had four children, John Pairman (b. 1923), Barbara (1925-1979), Joanna (1935-1935), and Margaret Wylde (b. 1937). Soon after her first two children were born, Eleanor P. Brown published a paper with Rudolph E. Langer, another 1922 student of Birkhoff who had also come to Dartmouth in 1922, and who remained on the faculty there until 1925.

John Pairman Brown, the eldest child, majored in mathematics and classics at Dartmouth, was in the US Army Air Corps, was a junior fellow at Harvard, and later earned a doctorate from Union Theological Seminary. His positions included ones at American University of Beirut, the Ecumenical Peace Institute in San Francisco, the Northern California Ecumenical Council, and the Graduate

Theological Union, among others. He served as a representative to peace events at various places throughout the world, and has published extensively, mainly in classics and on New and Old Testament themes. Barbara Brown graduated from Vassar in three years after majoring in English and classics. She earned both a master's degree and a PhD in language and literature from Rutgers University and was a lecturer in English at the Rutgers Newark campus for several years before her death at fifty-four. Margaret Brown studied at Brown University and became a medical editor and medical transcriptionist. All of the children married and had families.

Most summers the Brown family went to Martha's Vineyard, where B. H. Brown's parents had a small cottage. His parents also spent about four months a year with the Browns in Hanover. Otherwise, there was little traveling; neither Nora nor B. H. Brown drove an automobile or traveled by air. However, Nora Brown did take John and Barbara, the two older children, to Scotland for visits twice when they were young, once in summer 1929 and again in summer 1934; and in March of 1936, she and Barbara made a trip to Bermuda. Also, often in the spring she took a train to Boston to see the flower show and stayed overnight.

It appears that Nora Brown began to learn Braille in about the late 1940s or early 1950s. Her daughter Margaret recalled that after learning regular Braille, she then learned the Nemeth Code for mathematical notation. In a letter to one of the authors, Margaret wrote, "Geometry was a particular problem, because you really need diagrams. Braille is done on paper like thin cardstock. So she rounded up all kinds of household implements like pinking shears and pastry wheels and such and created diagrams that could be felt with the fingers, like the Braille symbols. Apparently nobody had ever done this before." Nora Brown's son-in-law Thomas Streeter recalled a visit to Hanover in which he was shown some of her work. "A graduate student at Harvard was blind and needed a particular book put into Braille, and it was full of mathematical symbols. What to do? The sewing machine, of course. She had written down the math and had it beside the machine. She put a piece of Braille paper under the foot and proceeded to reproduce the symbols by guiding the paper under the needle. It had to be the mirror image of what she had written." An article in the Hanover Gazette, probably published in 1959, indicated that she had just returned from attending the Third Annual Conference of the National Braille Club in New York, where mathematical workshops were directed by Abraham Nemeth. The article indicated that she was transcribing two mathematical texts, one for a freshman at Boston College and one a reference book on group theory for a post-graduate course at Columbia University. The article also noted that in addition to her work with Braille, she was holding conferences with Dartmouth freshmen three hours a week, and that she had taken over a course at the end of spring term.

Her daughter Margaret also wrote: "For all the satisfaction that she got from these [Braille] projects, the only time I saw her truly happy was when she was teaching. And she had precious little opportunity to do that, being obviously ahead of her time and also stuck in a males-only college community

and in a world where it was well-nigh impossible for married ladies to function professionally." Eleanor P. Brown was, however, a part-time instructor of mathematics at Dartmouth from September 1955 until June 1959.

After a lengthy illness, Eleanor P. Brown developed metastatic breast cancer and was in a nursing home in nearby White River Junction, Vermont, until her death there at age seventy-seven in 1973. She was survived by her husband, two sisters, three children, seven grandchildren, and one great-granddaughter. Bancroft H. Brown died on May 7 the following year.

Theses and dissertation:

1920 [Pairman, E.] Singular points of algebraic space curves. Minor thesis, Radcliffe College. Handwritten.

1921 [Pairman, E.] The absolute differential calculus and its applications. Minor thesis, Radcliffe College. Handwritten.

1922 [Pairman, E.] Expansion theorems for solutions of a Fredholm linear, homogeneous, integral equation of the second kind, with kernel of special non-symmetric type. PhD dissertation, Radcliffe College, directed by George David Birkhoff. Typescript.

Publications:

1918 [Pairman, E.] On a difference equation due to Stirling. Proc. Edinburgh Math. Soc. 36:40-60. Reviews: JFM 46.0714.04 (D. M. Winch); Rev. semestr. publ. math. 27, pt. 3: 32 (W. Boomstra). Presented to the Edinburgh Math. Soc., 11 Jan 1918.

1919a [Pairman, E.] Tables of the Digamma and Trigamma Functions. Tracts for Computers, ed. K. Pearson, no. 1. Cambridge: Cambridge University Press and Chicago: University of Chicago Press. Review: Amer. Math. Monthly 28:265-66. Reprint: 1954. Cambridge: Cambridge University Press.

1919b [Pairman, E.] with K. Pearson. On corrections for the moment-coefficients of limited range frequency distributions when there are finite or infinite ordinates and any slopes at the terminals of the range. Biometrika 12:231-58. Review: J. Royal Stat. Soc. 83:172.

1927 with R. E. Langer. On a class of integral equations with discontinuous kernels. Trans. Amer. Math. Soc. 29:683-715. Published version of part of PhD dissertation. Review: JFM 53.0351.02 (A. Hammerstein). Presented by R. E. Langer as "On the theory of integral equations with discontinuous kernels" to the AMS, Philadelphia, PA, 28 Dec 1926; abstract: Bull. Amer. Math. Soc. 33:136 no7.

Abstracts not listed above:

1923 Expansion theorems for a certain homogeneous integral equation. Bull. Amer. Math. Soc. 29:102-03 no3. Presented to a meeting of the AMS, Cambridge, MA, 27-28 Dec 1922. Based on PhD dissertation.

1926 with R. E. Langer. On the theory of integral equations with discontinuous kernels. Bull. Amer. Math. Soc. 32:120-21. Presented by R. E. Langer to a meeting of the AMS New York City, 1-2 Jan 1926 no3.

Presentation not listed above:

[Pairman, E.] A new form of the remainder in Newton's interpolation formula. Presented to the Edinburgh Mathematical Society, 8 Feb 1918.

References to: MacTutor.

McCallum, Margaret. "Dartmouth Faculty Wife Performs a Unique and Much Appreciated Service," Hanover (NH) Gazette, [1959].

"PhD '22, Eleanor Pairman Brown." (Obituary) Radcliffe Quarterly (December 1973): 33.

Other sources:

Owens questionnaire 1937; application for social security account number

1956; extensive communications with son John Pairman Brown, daughter Margaret B. Schorm, son-in-law Thomas W. Streeter, and granddaughter Deborah Streeter

2002; University of Edinburgh Special Collections; communications with Dartmouth College Archives and with Radcliffe College Archives, Schlesinger Library, Radcliffe Institute (Radcliffe College student files, 1890-1985);

"Peccavimus!" Biometrika 12 (1919): 266-81;

Della Fenster, Deborah Kent, and Thomas Archibald, "The first world war and mathematics in the United States";

Scotland Census 1891, 1901; US Census 1930 NH.

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