MERRILL, Winifred (Edgerton). September 24, 1862–September 6, 1951.
Wellesley College (BA 1883), Columbia College (PhD 1886).

Winifred Haring Edgerton was born in Ripon, Wisconsin, the daughter of Clara (Cooper) and Emmet Edgerton. Both of her parents were born in about 1830, her mother in Vermont and her father in New York State. At the time of the 1860 census, her parents and eight-year-old Eber Edgerton born in New York were living with her mother's parents in Ripon. Both her father and her maternal grandfather were listed as farmers. It appears that a few years after her birth, Winifred's family moved to New York City, where her father was a real estate operator.

Winifred Edgerton received her precollege education from private tutors and graduated from Wellesley in 1883. She received a strong mathematics education at Wellesley. While she was there the mathematics faculty consisted of Helen Schafer and Ellen Hayes, both Oberlin graduates; Eva Chandler, a University of Michigan graduate; and Sophia B. Horr, teacher of mathematics and drawing. The mathematics electives at that time included analytic geometry, differential and integral calculus, analytical mechanics, and mathematical astronomy.

After her graduation, Edgerton moved back to New York City and lived with her parents, who supported her decision to continue her study of mathematics and astronomy at Columbia College, which offered graduate degrees in pure science until the formation of Columbia University in 1896. Although the college had not awarded degrees to women, Edgerton had the backing of Columbia's president, Frederick A. P. Barnard, a strong supporter of the admission of women to Columbia College. She had met Barnard through Melvil Dewey, who had been librarian at Wellesley and had become the head of the library at Columbia.

During 1883 Edgerton did independent work in mathematical astronomy, and in January 1884 she applied to Columbia to pursue her studies in the observatory under the direction of John K. Rees, one of the charter members of the AMS. The Reverend Morgan Dix, rector of Trinity Church, who in 1883 had led the opposition of the Columbia College trustees to a move to coeducation, apparently was convinced that she should be given the opportunity to work in the observatory. Dix kept a diary that included his views on coeducation and Edgerton's admission to Columbia; a transcription of those entries is preserved in the Winifred Edgerton Merrill file in the Columbiana collection. On January 18, 1884, he wrote, "the principal thing [the Committee on the Course and Statutes of Columbia College] did was to admit Miss Winifred H. Edgerton to the observatory. . . ; the case was of an absolutely exceptional nature, and established no precedent for others." Two years later, on February 1, 1886, Dix noted that "I introduced a resolution in favour of allowing Miss Edgerton to present herself for examination for the degree of Doctor of Philosophy, and moved its reference to the Committee on the Collegiate Education of Women." In June he "moved that Winifred Edgerton have the degree of Ph.D., cum laude, which was unanimously agreed to. She fully deserves it."

Edgerton's admission to Columbia was specifically to allow her access to the astronomical instruments and not as a student per se. In a 1933 speech, Virginia C. Gildersleeve, then dean of Barnard College, quoted several passages from minutes of the trustees concerning Edgerton's admission to Columbia and the granting of her degree. The February 4, 1884, minutes of the trustees show that they gave her "access to the Observatory and the use of its instruments, placing her under the

direction of adjunct professor Rees, with the understanding that she will render, from time to time, such assistance in the practical work of the Observatory as may be in her power," and the June 7, 1886, minutes indicate that she had pursued a "course in Practical Astronomy and Pure Mathematics in the Graduate Department" (Winifred Edgerton Merrill file). In 1982 Edgerton's son, Hamilton Merrill, reported that she had told him "that a condition of her admission was to dust the astronomical inst[rument]s and so comport herself as not to disturb the men students."

While working in the observatory, Edgerton also taught at Mrs. Sylvanus Reed's Boarding and Day School for Young Ladies. Caroline Gallop Reed had opened her school in 1864 and by 1878 it had a collegiate department that was incorporated as a college in 1883. In a 1944 interview with Winifred Edgerton Merrill by Columbia University librarian Roger Howson, Howson noted and Merrill confirmed that "there was some talk of taking in Mrs. Reed's school as part of Columbia" (Winifred Edgerton Merrill file). Although this did not happen, with Edgerton as a chaperon the young women from that school were permitted to sit in on lectures at Columbia. Also teaching at Mrs. Reed's school at this time was a future Columbia president, Nicholas Murray Butler.

Edgerton also attended at least one class in geology from Johns S. Newberry, who gave her a microscope to use in her classes at Mrs. Reed's school. Her mathematics instructors were William Guy Peck and J. H. Van Amringe. Although she later reported writing two dissertations, one in mathematics and one in astronomy, her degree was awarded on the basis of a dissertation in mathematics. In his report to the president of Columbia in May 1886, Van Amringe paraphrased the prefatory note to the dissertation by saying that "it exhibits originality of treatment in the plan of unifying the different systems of analytical geometry, . . . , the application of quaternions as a reference system for multiple integrals by means of the equations of transformation, . . . , and the reduction of the equations of transformation to the simple formula, $\rho = rk^t j^s k j^{-s} k^{-t}$" (pp. 79–80).

In 1886 Winifred Edgerton became the first woman to receive a degree from Columbia and the first American woman to receive a PhD in mathematics. Her degree is often listed as being in astronomy although the May 3, 1886, president's annual report to the Columbia College board of trustees shows her dissertation to be as shown below in **1886**. Nonetheless, in 1937, when she was seventy-four years old, Winifred Edgerton Merrill listed her dissertation as "(1) Mathematical Astronomy. (a) Computation of the Orbit, the Comet of '83. Data furnished by Harvard University. (b) Determination of Latitude and Longitude of New York City from Direct Observations. (2) Pure Mathematics. Translation and Relations of Various Systems of Coordinates. Published at Columbia University" (Owens questionnaire). Dean Gildersleeve also referred to the first part of this title when quoting the trustees minutes of January 7, 1884: Edgerton "has pursued for several years a line of study in the pure and applied mathematics, and in mathematical Astronomy, in which she has shown an extraordinary proficiency, concluding with an independent calculation of the orbit of a comet from data furnished by the Observatory at Harvard" (Winifred Edgerton Merrill file). Furthermore, a Columbia University timeline entitled "Women at Columbia" shows that in 1886 "Columbia awards its first degree to a woman, a PhD in astronomy to Wellesley College graduate Winifred Edgerton."

After receiving her PhD, Edgerton remained at Mrs. Reed's school for a year as vice-principal until her marriage on September 1, 1887, to Frederick James Hamilton Merrill (1861–1916). She had been "offered the professorship of mathematics and astronomy [at Wellesley] but declined it in preference for marriage" ("First Alumna Button-Holed Trustees for Degree," *Columbia Alumni News*, 28 Apr 1939). Frederick Merrill was born in New York City, received a bachelor's degree from the Columbia School of Mines in 1885, worked on the New Jersey Geological Survey, and returned to the School of Mines on a fellowship in 1886 while still working on the geological survey. At the time of their marriage, F. J. H. Merrill was an instructor in paleontology and geology at Columbia; he received his PhD in 1890. From 1890 to 1904 he held various positions with the state of New York in Albany, including director of the New York State Museum.

In 1888 Winifred Edgerton Merrill was asked to serve on a small committee to form a separate woman's college to be part of Columbia. Because there were men on the committee and it met in an office in downtown Manhattan, Frederick Merrill disapproved; as a result she resigned from the committee. However, her name appears on the request to Columbia's trustees asking for the establishment of such a woman's college. The resulting school, Barnard College, was founded in 1889, shortly after President Barnard's death. In Howson's 1944 interview, Merrill recounted an instance of disapproval from her husband that occurred while they were living in Albany: "I was asked to be on the school board. Lieutenant-Governor Herrick came in to ask me. My husband did not speak to me for two days. He was born in New York and had these ideas of what was proper for women to do" (Winifred Edgerton Merrill file).

In 1900 Frederick Merrill was New York state geologist. At that time, the family was living in Albany and those enumerated in the household were Frederick and Winifred, three children, a cook, a butler, a chambermaid, and a nurse. Their eldest child, Louise (1888–1982), was born in New Jersey; Hamilton (1890–1982), Winifred (1897–1943), and, later, Edgerton (1901–1960) were born in New York State. In 1904 Frederick Merrill left Albany to become a mining geologist in New York City. In 1907 he moved to Nogales, Arizona, and in 1913 to California. Winifred Edgerton Merrill and her children remained in the New York City area. F. J. H. Merrill died in 1916 in Los Angeles.

While raising her family, Winifred Merrill remained active in educational endeavors. She taught at the Emma Willard School in Troy 1894–95, served as an alumna trustee of Wellesley 1898–1904, was president of the Wellesley Alumnae Association 1889–90, served on the Association of Collegiate Alumnae Committee on Collegiate Administration 1899–1904, and was also a member of Albany's Monday Evening and Thursday Morning clubs.

After her return to the New York City area, Winifred Edgerton Merrill resumed her teaching career as the head of the mathematics department of a girls' school, Highcliff Hall, in Yonkers. In 1906 she founded the Oaksmere School for Girls, a non-sectarian boarding school in Westchester County, New York. In 1910 Winifred Merrill, her four children, and several servants were living in New Rochelle, where she was principal of the school. The school was first in New Rochelle but soon moved to her estate on Long Island Sound in the village of Larchmont, a part of the town of Mamaroneck. Merrill directed the school, which was also known as Mrs. Merrill's School and the Merrill School, for twenty years. She opened a branch

in Paris, Oaksmere Abroad, in 1912 and returned from Europe with her younger daughter, Winifred, in September of that year. Merrill made several trips to Europe again in the early 1920s, usually traveling with her daughter Winifred and once with Winifred and her son Edgerton. A 1922 wedding announcement for her daughter Winifred refers to Edgerton Hall in Mamaroneck as Merrill's country home.

Winifred Merrill was supportive of America's participation in the first international track meet for women, which was held in Paris in August 1922. The Eastern trials were held at Oaksmere, and, according to the *New York Times*, Merrill "agreed to entertain America's team and pay all its expenses while it is in Paris, in addition to donating the use of Oaksmere School and its equipment for the May 13 meet" (April 16, 1922). In 1928 Merrill closed Oaksmere, and on September 26th of that year her appointment as "director of the Three Arts Wing of The Barbizon for students of music, drama, and art" was announced in an advertisement in the *New York Times*. Some sources indicate that she moved from Mamaroneck to the Barbizon Hotel in New York City in 1926 and served as the librarian for that residence hotel for women.

In 1918 Merrill published a brochure, *Musical Autograms*, the origin of which she explained in the preface.

> In my early education I was greatly impressed by a book by Benjamin Peirce, entitled "Ideality in the Physical Science", and it was the influence of this book upon my mentality that some years later led me to choose as the subject of the thesis for my Doctor's degree in Mathematics, at Columbia University "The Unification of the Several Systems of Mathematical Co-ordinates." Consciously and unconsciously throughout a busy life ... I continued this mental search for co-ordinating elements in life-experiences, in art-forms, in the complexities of educational problems, always searching for a better understanding of the nature of things through some underlying unifying principle....
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> My present invention is founded upon the principle that every line or point in nature or in art or in science is subject to mathematical expression through some one of the many systems of co-ordinates or reference axes, among which I include one which I denominate "Musical Axes." The lines referred to may exist in nature, art or science, or be seen in the imagination, but are subject always to the mathematical law and are thus capable of relative expression. (*Musical Autograms*, iii–iv)

She then produced "melodic outlines" based on the signatures of twenty famous men. These outlines were set to music by Robert Russell Bennett and printed by the music publisher G. Schirmer, for whom Bennett was then a copyist and arranger. Bennett later became famous as an orchestrator of Broadway and movie musicals. He wrote in his autobiography that "it was her hope that a person's signature, written across a musical staff, would furnish a melodic line expressive of that person's character, and possibly his or her mood at the time of signing" (p. 49). Bennett later played the music for Merrill at "a talk on Musical Autograms to an important group in Chicago" (p. 56) and then opened "the short-lived Musical Autograms shop ... on Lexington Avenue" in New York City (p. 58n). Merrill

introduced Bennett to her daughters, and in 1919 he married her eldest daughter, Louise.

In addition to her contributions to the books by Maude Fiero Barnes on Italian art and historic periods noted in the introduction to *Renaissance Vistas* and the editor's note to *Historic Vistas*, Merrill held the copyright on these volumes of essays, some of which had been presented as lectures at Oaksmere during the 1910s.

In 1933, for the fiftieth anniversary of her graduation from Wellesley, her class, together with the Woman's Graduate Club of Columbia University and the Zeta Chapter of Phi Delta Gamma, presented Columbia with a portrait of Winifred Edgerton Merrill. The painting, by Mrs. H. E. Ogden Campbell, bears the inscription "She opened the door," and was first hung in Philosophy Hall but later moved to Low Library. The painting was accepted by her fellow teacher from the 1880s, Columbia president Nicholas Murray Butler.

In addition to her involvement with the Wellesley Alumnae Association and board of trustees, Merrill served as president of the Diocesan Branch of the Woman's Auxiliary of Albany, of the New York Branch of the Intercollegiate Alumnae Association, and of the Barbizon Book and Pen Club. She was a member of the Women's Graduate Club of Columbia University, the Women's University Club, the Woman's Club of Larchmont, the Classical and Wellesley clubs of New York City, the Zeta Chapter of Phi Delta Gamma, and, while at Wellesley, Zeta Alpha. She held a life membership in the AAAS. A 1939 article in the *Columbia Alumni News* noted that "she has four children and five grandchildren, resides at The Barbizon, is a vehement supporter of President Roosevelt among a family of Republicans and was active in the campaign to repeal the eighteenth amendment, speaking from soapboxes throughout the city."

For the last two years of her life, Merrill lived with her son Hamilton in Fairfield, Connecticut, and died a few weeks before her eighty-ninth birthday in nearby Stratford. Her funeral was held in Trinity (Episcopal) Church in New York, the same church in which she had been married. She was survived by her two sons and a daughter.

Organizational affiliations: AAAS, ACA (now AAUW).

Dissertation:

1886 [Edgerton, W.] Multiple integrals (1) Their geometrical interpretation in Cartesian geometry; in trilinears and triplanars; in tangentials; in quaternions; and in modern geometry. (2) Their analytical interpretation in the theory of equations, using determinants, invariants and covariants as instruments in the investigation. PhD dissertation, Columbia College, directed by John Howard Van Amringe. Handwritten.

Publications:

1899 The endowment fund. *Wellesley Mag.* 8:1–6.

1918 *Musical Autograms: An Album of Twenty Melodic Silhouettes*. New York: G. Schirmer.

1930a Editor's note. In *Historic Vistas*, by Maude Fiero Barnes. New York: William Farquhar Payson.

1930b Introduction. In *Renaissance Vistas*, by Maude Fiero Barnes, v–vii. New York: William Farquhar Payson.

References to: BiDWSci, BioWMath, MacTutor, NatCAB 41, NotMat, NotSci 2, NotTwCS 1S, Sc&ItsT 6.

"Ending life at college: Commencement exercises of Columbia College. Awarding of honors at the Academy of Music–Miss Winifred Edgerton receives a degree." *New York Times*, 10 Jun 1886.

"Married at Trinity." *New York Times*, 2 Sep 1887.
"Columbia to Honor First Woman Student: Portrait of Mrs. Merrill, Who Received Degree in 1886 to Be Hung at University." *New York Times*, 26 Mar 1933.
"Columbia Honors its First Woman Graduate." *New York Times*, 1 Apr 1933.
Meyer, Annie Nathan. *Barnard Beginnings*. Boston, MA: Houghton Mifflin, 1935.
"First Alumna Button-Holed Trustees for Degree; Second Woman Listed as Columbia College Grad." *Columbia Alumni News*, 28 Apr 1939, 8.
"Mrs. Merrill, 88, Columbia Pioneer: First Woman Graduate of the University Dies–Leader in Founding of Barnard." *New York Times*, 7 Sep 1951.
Amidon, Beulah. "Tribute to Mrs. Merrill." *New York Times*, 20 Sep 1951.
Faier, Joan Sari. "Columbia's First Woman Graduate." *Columbia Today*, Winter 1977, 27–29.
Rosenberg, Rosaline. "Winifred Edgerton."

Related manuscript material: Winifred Edgerton Merrill file, Columbiana collection, Columbia University Archives.

Other sources: Owens questionnaire 1937; Williams Papers; correspondence with Hamilton Merrill, June 1982; Columbia University Archives; "Annual report of the President of Columbia College for the year 1885–86, made to the Board of Trustees May 3, 1886 (New York); Green and LaDuke, "Contributors to American Mathematics"; R. R. Bennett, *"The Broadway Sound": The Autobiography and Selected Essays of Robert Russell Bennett*, ed. G. J. Ferencz, (Rochester, NY: University of Rochester Press, 1999); "Women at Columbia," Columbia250; "Women Athletic Tryouts Arranged," *New York Times*, 16 Apr 1922; Tuttle, Jane P., "They set the mark: United States teammates who competed in the first international track meet for women"; US Census 1850 NY, 1860 WI, 1870, 1880, 1900, 1910 NY.

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