LADD-FRANKLIN, Christine. December 1, 1847–March 5, 1930.
Vassar College (BA 1869), Johns Hopkins University (PhD completed 1882, awarded 1926).

Christine Ladd was born in Windsor, Connecticut, the eldest of the three children of Augusta F. (Niles) (1825–1860) and Eliphalet Ladd (1822–1885). Both of her parents came from old New England families, her father's from New Hampshire and her mother's from Connecticut. Her parents married in 1846. Her brother, Henry (b. 1850), was born while the family lived in New York where her father was a merchant. Her sister, Jane Augusta (b. 1854), was born after the family had moved to her maternal grandmother's home in the Poquonock section of Windsor in 1853. Many years later Ladd described her father as having been both a merchant and a gentleman farmer. Ladd's mother, who was a supporter of women's rights, died of pneumonia when Ladd was twelve. Soon after her mother's death Ladd began keeping a journal. In 1862 her father married Mary E. Barnes (1839–1903), and they had two children, Katharine (b. 1865) and George B. (1867–1881).

From 1860 to 1863, Ladd attended schools in Portsmouth, New Hampshire, while living with her paternal grandmother. She spent the next two years at a college preparatory school, the Wesleyan Academy. The school had been coeducational since it opened in Wilbraham, Massachusetts, in 1825 because "in the school as in the [Methodist] church, the sexes were to have a common platform of opportunity" (Sherman, *History of the Wesleyan Academy*, 77). Nonetheless, the male and female students were enrolled in different courses of study, and at graduation males presented orations and females presented essays. Although a number of sources say that Ladd graduated as valedictorian of her class, the program for the June 1865 "Anniversary Exercises of Wesleyan Academy" lists another female student as presenting the "Valedictory Essay" and Ladd as presenting the "Classical Essay."

Just before leaving for her second year at Wilbraham, Ladd saw a notice announcing the planned opening of Vassar College in fall 1865. She hoped to attend but did not think her father would "give his consent to such a Quixotic scheme" (Ladd Diary, 10 Aug 1864). In fact, Ladd's father, who was very supportive of her studies at Wilbraham, had financial and health problems in the mid-1860s, and Ladd spent 1865–66, the year after she graduated from Wilbraham, at home in Poquonock with her infant half-sister. Her maternal grandmother, eighty-one years old in 1865, was not supportive of her furthering her education, thinking that Ladd would not be able to find a husband after college. However, by the end of July 1866 Ladd had convinced her grandmother to support her plans to attend college and had convinced her mother's older sister, Juliet Niles, to pay the tuition. At first her father did not approve her plans but agreed in a short time, and in September 1866 Ladd enrolled at Vassar. Ladd studied at Vassar 1866–67 and 1868–69. She did not return 1867–68 because of a lack of funds; instead, she spent the fall semester teaching in Utica, New York. At Vassar she was influenced strongly by the astronomer Maria Mitchell and by Charles S. Farrar, professor of mathematics, natural philosophy, and chemistry. She was most interested in physics, particularly in the vibrations of the elastic pendulum.

After graduating from Vassar in 1869, Ladd began teaching at a girls' school in Hollidaysburg, a town near Altoona in the mountains of central Pennsylvania. She

spent two years there and at the beginning of her second year teaching reported that she was doing "special investigations in Physics, and in mathematical research" (letter to Auntie [Juliet Niles], 7 Sep 1870). In May 1871 she was offered, and accepted, a position at a seminary in Washington, Pennsylvania, in the southwestern part of the state. While in Washington, she studied with George C. Vose, a professor of mathematics at Washington and Jefferson College, then a small all-male liberal arts college. Ladd described Vose as "among the first ten or twelve mathematicians in the country ... [who] leaves his family to poverty and dirt, while he absorbs himself in Quarternions [*sic*]" (Ladd Diary, 14 Nov 1871). Prior to working with Vose, Ladd had considered studying in Cambridge, Massachusetts, with James Mills Peirce or in St. Louis, Missouri, with William Chauvenet. In a June 9, 1872, entry in her diary Ladd mentions what appears to be her first publication in mathematics, a problem on quaternions that appeared in the London *Educational Times*. One month later, on July 16, she wrote in her diary that she had intended to spend the entire summer vacation studying with Vose; however, her brother had intimated in a letter "that filial obligations require my presence at home," so she would stay in Pennsylvania only until the end of the month.

The last entry in the Ladd diaries preserved at Vassar College was on April 27, 1873, and was written while she was living with relatives in Boston, Massachusetts. It begins, "From October to January, Mathematical courses at Harvard University. Not as profitable as they might have been, as they were not followed by an examination." Although the "Harvard Annex," the precursor to Radcliffe College officially known as the Cambridge Society for the Collegiate Instruction of Women, was not founded until 1879, and there is no record of Ladd's having attended classes at Harvard, she reported in November 1872 that she was regularly enrolled as a student there and was attending lectures of W. E. Byerly, then a graduate student, and J. M. Peirce, "Jimmie Mills as we Harvard fellows call him" (letter to Auntie, 3 Nov 1872, Box 2, Christine Ladd Franklin and Fabian Franklin papers). Although the final entry in her diary concludes: "Have applied for a second degree at Vassar" (27 Apr 1873), Ladd did not continue her formal studies at the time. She remained in the Boston area, taught at Chelsea High School, and continued her informal work in mathematics. In early 1875 Ladd's first publication, other than problems and their solutions, appeared in the *Analyst*, the recently founded American journal, which became the *Annals of Mathematics* in 1884. In it she reported on the contents of the *Journal für die reine und angewandte Mathematik* (Crelle's Journal), one of the most important European mathematical journals, and noted that in the Boston Public Library the journal was on the shelves with its leaves uncut.

By the spring of 1875 Ladd was teaching in Union Springs, New York. In the spring of 1876 she met friends from Woods Hole while visiting nearby Cornell University and spent some time studying biology. It appears that she also studied mathematics at Cornell. J. L. Coolidge's obituary of W. E. Byerly in the *Bulletin* of the AMS notes that Ladd was a student of Byerly when he was an assistant professor at Cornell 1873–76. It also suggests that Byerly's experience teaching her may have been a factor in his "favorable opinion of the intellectual capacity of women" and his 1879 support for providing private classes for women at Harvard, where he was then an assistant professor (p. 296).

Ladd remained in Union Springs through at least May 1878. In a letter of March 1877 she reported that she was writing a mathematics book. Also while in Union

Springs, problems that she posed and those that she solved appeared frequently in the *Educational Times*; the *Analyst*; the *Mathematical Visitor*; and a local newspaper, the *Yates County Chronicle*. From the first issue of the *Mathematical Visitor* (October 1877) we learn that Ladd is "Professor of Natural Sciences and Chemistry, Howland School, Union Springs, Cayuga County, New York."

On March 27, 1878, Ladd wrote to J. J. Sylvester asking him whether Johns Hopkins University would refuse her permission to listen to his lectures "on account of [her] sex?" (Gilman Papers). At the time she did not mention her publications but described herself only as "a graduate of Vassar College ... [who had] attended mathematical lectures at Harvard University." On April 2, 1878, Sylvester wrote Daniel Coit Gilman, president of Johns Hopkins, that he "should rejoice to have her as a fellow worker among us.... My own impression is that her presence among us would be a source of additional strength to the University." In an undated letter detailing Ladd's accomplishments he noted that "she is favorably known to Dr. Salmon and Prof. Cayley with each of whom she has corresponded on Mathematical subjects correcting an error or imperfection in a treatise of the one and suggesting an improvement in a memoir or book of the other. She is well known in America and England and in a second number of The Analyst ... she has written a profound paper on Quaternions" (Gilman Papers).

Despite this endorsement by Sylvester, Johns Hopkins would not admit her, or any other woman, as a student. However, the executive committee of the board of trustees was "willing that the Faculty should examine & certify to the attainments of ladies who may offer themselves, without having been instructed here, as candidates for academic degrees" (D. C. Gilman to Miss Ladd, April 26, 1878, MS 1, Daniel Coit Gilman Papers, Special Collections, Sheridan Libraries, The Johns Hopkins University). They also consented to her attending Sylvester's lectures without charging her tuition.

Ladd spent the next four years studying at Johns Hopkins and traveling in Europe. During this time she was not officially enrolled in the university but, at times, received the stipend of a fellow. She continued contributing to the *Educational Times* and the *Analyst* and published substantial articles in the second and third volumes of the *American Journal of Mathematics*. She appears to have enjoyed strong support from the mathematics faculty. An apparently unsolicited letter from William E. Story, Thomas Craig, Fabian Franklin, and O. H. Mitchell suggested that she be given the fellow's stipend upon her return from an extended trip to Europe in early 1882. The spring 1882 term was her last at Johns Hopkins. What should have been her dissertation for an 1882 PhD was published in *Studies in Logic by Members of the Johns Hopkins University*, which was edited by her advisor, C. S. Peirce, brother of J. M. Peirce with whom Ladd had studied at Harvard. However, the board of trustees did not permit her to be awarded the degree because she was a woman.

On August 24, 1882, Ladd married Fabian Franklin (1853–1939), a member of the Johns Hopkins mathematics faculty. Franklin was born in Eger, Hungary, immigrated to the United States when he was four, received his bachelor's degree from Columbian College (now George Washington University) in 1869, worked as a civil engineer and surveyor until 1877, and earned his PhD in mathematics at Johns Hopkins in 1880. In June 1883, their infant son died shortly after his birth. Two months later, on August 17, Lucien A. Wait, then associate professor of mathematics at

Cornell, wrote to Fabian Franklin: "I am very glad to hear that Mrs. Franklin has so much improved. Her acceptance of work in my correspondence University gives me great pleasure" (Box 6, Christine Ladd Franklin and Fabian Franklin Papers). However, there is no indication that she ever actively participated in this venture. The following summer she gave birth to a daughter, Margaret Ladd Franklin.

Although Christine Ladd-Franklin never held a regular position in Baltimore, in 1887 she reported that she taught "for an hour or so every morning in Miss Randolph's school" and that she had "no private pupils at present" (letter to Auntie, 14 Nov 1887). Later, in 1889, she turned down a position as lecturer at Bryn Mawr. During this time she continued her mathematical research and began a career in the area of physiological optics. Her first paper in this field, which was a mathematical investigation of binocular vision, appeared in 1887. That same year Vassar College bestowed on her an LLD, the only honorary degree it has ever granted. During this period some of her papers appeared under the hyphenated name Christine Ladd-Franklin, but she did not use this name consistently until about 1905; before then her name appeared in various forms including C. Ladd Franklin.

In 1891 Fabian Franklin took a sabbatical leave in Germany with his wife and daughter. Ladd-Franklin spent part of that year in Göttingen in the laboratory of G. E. Müller but was denied the official status of student. She also spent part of the year in Berlin working in Hermann von Helmholtz's laboratory. While in Berlin she began a correspondence with Felix Klein concerning the admission of women to Göttingen. In May 1892 she learned from Klein that "for the time being [the Göttingen faculty] mainly support only what will not satisfy you, the admission of female guest auditors (under control of the prorector [vice chancellor] and with the assumed assent of each individual docent)" (Box 4, Christine Ladd Franklin and Fabian Franklin papers). The next summer, at the World's Columbian Exposition in Chicago, she met Mary Frances Winston (Newson), who was to become one of the first three guest students and the first American woman to earn a PhD in mathematics from a German university. When Winston did not receive a fellowship from the Association for Collegiate Alumnae (ACA, later AAUW) in order to attend Göttingen, Ladd-Franklin offered her $500 to help cover her costs for the year.

In 1894 Ladd-Franklin returned to Berlin without her family in order to work for several months on her theory of color vision in Arthur König's laboratory. She had announced her first results in this area two years earlier and continued publishing in it for another thirty years. In a 2000 article, D. C. McCarty included Ladd-Franklin among seven names that appeared in "name indices of historical works on logic and ... on those on nineteenth century perceptual physiology" and noted that "in those days, a liaison between thought and sight was recorded in the vocabulary that physiologists and psychologists adopted for visual processes and phenomena" (p. 368). It was on the basis of work in this field that in 1906 Christine Ladd-Franklin was starred for psychology in the first edition of *American Men of Science*. It was also on the basis of this work that she was offered an honorary doctorate by Johns Hopkins to be bestowed during the university's fiftieth anniversary celebration in 1926. Rather than accept the honorary degree, she asked for, and received, the doctorate she had earned forty-four years earlier.

During the time that she was working in the theory of color vision, Ladd-Franklin kept up her interest in logic. In 1892 she published a review of the first volume of Ernst Schröder's *Vorlesungen über die Algebra der Logik*; that review has been

cited frequently in articles on the history of logic. In 1893 she asked to give a series of lectures on that subject at Johns Hopkins and was turned down. Starting in 1904 she became the only woman on the Johns Hopkins faculty, teaching there as a part-time lecturer in logic and psychology while being paid considerably less than the $500 stipend she had received as a student. There was no question of anti-nepotism practices keeping her from being hired since Fabian Franklin had resigned his position as associate professor at Johns Hopkins in 1895 in order to become editor of the *Baltimore News*. She remained a part-time lecturer until 1909 when she moved to New York with her family. The move to New York was to allow Fabian Franklin to take a job as an associate editor of the *New York Evening Post*. He resigned that position in February 1917 over a political disagreement with the paper's owner and in 1919 started his own literary and political weekly publication, *The Review*, which later merged with *The Independent* to become *The Independent and The Weekly Review*. While in New York, Christine Ladd-Franklin taught as an unpaid part-time lecturer in logic and psychology at Columbia University.

In addition to her many scholarly publications, Ladd-Franklin frequently wrote popular articles and letters to newspapers and news magazines, none of which are included in her list of publications below. These were mainly concerned with women's rights, but also addressed other current events in which she had an interest, such as the use of Esperanto or the less well known international language Ido. She worked particularly hard in the cause of women's higher education. In 1897 she was involved in the formation of an organization to advance this cause, the Baltimore Association for the Promotion of the University Education of Women, and served as its chairman pro tem. This association tried to get Johns Hopkins to open its graduate school to women. This attempt was not successful, and the trustees did not agree to enroll women officially in graduate courses until 1907. At various times Ladd-Franklin served on the ACA committee on fellowships, serving as its first chairman, and speaking to that association on "The Usefulness of Fellowships" in October 1894. That talk was reprinted in the *AAUW Journal* in March 1953 with the comment that "sixty-three years later, it strikes such a sympathetic chord for those of us most closely associated with our fellowship program that we cannot resist representing it here in its entirety" (46:166). In 1899–1900 she and the three women who had received ACA European fellowships in mathematics, Ruth Gentry, Annie MacKinnon (Fitch), and Mary Winston (Newson), served on the ACA Council to Accredit Women for Advanced Work in Foreign Universities. She was also instrumental in the establishment of the Sarah Berliner fellowship and served as chairman of the committee that made the award until 1919 when the AAUW took over that role.

Christine Ladd-Franklin's scholarly bibliography includes over one hundred articles and reviews in logic and color theory. In 1929, the year before she died, a volume containing her collected works on color vision was published in the series International Library of Psychology, Philosophy, and Scientific Method; it was reprinted in 1973 in the series Classics in Psychology. In addition to the selected publications listed below and the many papers in color theory, there are additional mathematical works, published mainly under the name Ladd, including more than fifty solutions of questions from the *Educational Times* and the *Analyst*, some of which were abstracted in the *Jahrbüch über die Fortschritte der Mathematik* (JFM) or listed in Alonzo Church's "Bibliography of Symbolic Logic (1666–1935)" in the inaugural

volume of the *Journal of Symbolic Logic*. Church also listed articles that she had written for J. Mark Baldwin's 1902 *Dictionary of Philosophy and Psychology*, for which she served as associate editor for logic and psychology. In addition, Church's bibliography included an article on symbolic logic, which Ladd-Franklin had coauthored with E. V. Huntington, that appeared in the 1905 *Encyclopedia Americana*; in 1908 E. B. Wilson wrote in a review of a 1906 "critical-historical study of the logical calculus" that "the mathematician is almost certain to find more of value to him in the excellent though brief account of symbolic logic" by Huntington and Ladd-Franklin (p. 190). In 1938 she was described as "always militant in behalf of her color theory and the rights of women" (Boring, 414). Her work in logic was examined in a 1999 article in the *Bulletin of Symbolic Logic.*

Christine Ladd-Franklin died of pneumonia at age eighty-two at her home in New York City in 1930. She was survived by her husband and her daughter.

Organizational affiliations: AAAS, Optical Soc., Philos. Assoc., Psych. Assoc., Phi Beta Kappa.

Dissertation:

1882 [Ladd, C.] On the algebra of logic. PhD dissertation, Johns Hopkins University, directed by Charles Sanders Peirce. PhD granted 1926.

Selected mathematical and mathematically related publications:

1875 [Ladd, C.] Crelle's Journal. *Analyst* 2:51–52.

1877a [Ladd, C.] Determination of the locus of O. *Analyst* 4:47–48 (figure p. 22).

1877b [Ladd, C.] Quaternions. *Analyst* 4:172–74. Review: *JFM* 09.0411.01 (J. W. L. Glaisher).

1878a [Ladd, C.] Note on the solution of a congruence of the first degree when the modulus is a composite number. *Educ. Times* 30:41–42. Review: *JFM* 10.0139.02 (C. Ohrtmann).

1878b [Ladd, C.] On some properties of four circles inscribed in one and circumscribed about another. *Analyst* 5:116–17.

1878c [Ladd, C.] The polynomial theorem. *Analyst* 5:145–47. Review: *JFM* 10.0190.01 (J. W. L. Glaisher).

1879a [Ladd, C.] Note on Landau's theorem. *Educ. Times* 31:39. Review: *JFM* 11.0287.01 (C. Ohrtmann).

1879b [Ladd, C.] The Pascal hexagram. *Amer. J. Math.* 2:1–12. Review: *JFM* 11.0395.01 (A. Maynz).

1880a [Ladd, C.] The nine-line conic. *Analyst* 7:147–49. Review: *JFM* 12.0475.02 (J. W. L. Glaisher).

1880b [Ladd, C.] On De Morgan's extension of the algebraic processes. *Amer. J. Math.* 3:210–25. Errata, 3:v. Review: *JFM* 12.0045.03 (E. Netto).

1881 [Ladd, C.] On segments made on lines by curves. *Amer. J. Math.* 4:272.

1883a [Ladd, C.] On the algebra of logic. In *Studies in Logic by Members of the Johns Hopkins University*, ed. C. S. Peirce, 17–71. Boston: Little, Brown, and Co. Published version of PhD dissertation. Reviews of volume: *Science* 1:514–16; *Mind* 8:594–603 (J. Venn).

1883b The Pascal hexagram. *Science* 1:592–94.

1885a On the so-called d'Alembert-Carnot geometrical paradox. *Messenger Math.* 15:36–37. Review: *JFM* 17.0507.03 (J. W. L. Glaisher).

1885b Richet on mental suggestion. *Science* 5:132–34.

1887 A method for the experimental determination of the horopter. *Amer. J. Psych.* 1:99–111.

1889 On some characteristics of symbolic logic. *Amer. J. Psych.* 2:543–67.

1890a Review of *Elements of Logic as a Science of Propositions*, by E. E. Constance. *Mind* 15:559–63.
1890b Some proposed reforms in common logic. *Mind* 15:75–88.
1892 Review of *Vorlesungen über die Algebra der Logik (Exakte Logik)*, vol. 1, by E. Schröder. *Mind* n.s., 1:126–33.
1894 Sophie Germain, an unknown mathematician. *Century* 48:946–49. Postscript: 49 (1894): 157. Reprint: 1981. *AWM Newsletter* 11 (3): 7–11.
1896 The position of retinal images. *Nature* 53:341. Review: *JFM* 27.0721.01 (E. Lampe).
1899a Pictures in three dimensions. *Science* n.s., 10:45–6.
1899b Review of *German Higher Schools: The History, Organization and Methods of Secondary Education in Germany*, by J. E. Russell. *Science* n.s., 10:116–18.
1901 The reduction to absurdity of the ordinary treatment of the syllogism. *Science* n.s., 13:574–76. Review: *Bibliogr. Symbolic Logic, 1666–1935* #62.6. Presented to the Amer. Psych. Assoc., Baltimore, MD, 28 Dec 1900.
1911 The foundations of philosophy: explicit primitives. *J. Philos., Psych. Sci. Methods* 8:708–13. Further discussion on this paper appeared as: "Explicit primitives: a reply to Mrs. Franklin" by Warner Fite, 9:155–58 and "Explicit primitives again: a reply to Professor Fite" by Christine Ladd-Franklin, 9:580–85.
1912 Implication and existence in logic. *Philos. Rev.* 21:641–65. Presented to meeting of the Amer. Philos. Soc., Dec 1911.
1916 Charles S. Peirce at The Johns Hopkins. *J. Philos., Psych. Sci. Methods* 13:715–22.
1927 The antilogism. *Psyche* 8:100–103.
1928 The antilogism. *Mind* n.s., 37:532–34.
1931 La non-existence de l'existence: l'idéaliste pur et le réaliste hypothétique. *Rev. metaphys. morale* (Apr-Jun): 1–23.

Mathematical abstracts not listed above:
1918a Bertrand Russell and symbol logic. *Bull. Amer. Math. Soc.* 25:59–60 #20. Presented to a meeting of the AMS, Hanover, NH, 4–6 Sep 1918.
1918b Symbol logic and Bertrand Russell. *Philos. Rev.* 27:177–78. Presented to a meeting of the Amer. Philos. Assoc., Princeton, NJ, 27–28 Dec 1917.

Collected works on color vision:
1929 *Colour and Colour Theories.* International Library of Psychology, Philosophy, and Scientific Method. New York: Harcourt, Brace and Co. and London: Kegan Paul, Trench, Trubner and Co. Review: *Science* 69:647 (H. C. Warren). Reprint: 1973. New York: Classics in Psychology. Arno Press.

Selected references to: AmMSc 1–4; AmWomSc; AmNatBi; AZWoSci; BiCAW; BiDcPsy; BiDPsy; BiDWSci; BioWMath; CamDcAB; DcAmB; DcMAP; DcNAA; DcWomW; EncWB 2–23; InWom; InWom SUP; MacTutor; NatCAB 5,26; NotMat; NotSci 2; NotTwCS 1; NotWoMa; NotWoSc; Poggendorff 3–4, 6; Sc&ItsT 6; TwCBDA; WhAm 1; WhoEast 1930; WomSc; WomFir; WomWorHis.
Reyes y Prósper, Ventura. "Cristina Ladd Franklin. Matemática americana y su influencia en la lógica simbólica." *El Progreso Matemático* 1 (1891): 297–300.
Burr, Henry W. "Mrs. Ladd-Franklin." *New York Times*, 24 Jun 1922.
"Will Get Belated Degree." *New York Times*, 21 Feb 1926.
"To Restore Ideal at Johns Hopkins." *New York Times*, 23 Feb 1926.
"Woman PhD at 78 Tells Life Story." *New York World*, 28 Feb 1926.
Shen, Eugene. "The Ladd-Franklin Formula in Logic: The Antilogism." *Mind* n.s., 36 (1927): 54–60.
"Dr. Ladd-Franklin, Educator, 82, Dies." *New York Times*, 6 Mar 1930.
"For Anti-Feminists to Consider." Editorial. *New York Times*, 7 Mar 1930.
Woodward, R. S. "Obituary: Christine Ladd-Franklin." *Science* 71 (21 Mar 1930): 307.
"Scientist and Pioneer." *The Woman's Journal* 15 (Apr 1930): 29.

Hurvich, Dorothea Jameson. "Christine Ladd-Franklin." In *Notable American Women 1607–1950*, ed. Edward T. James, 2:354–56. Cambridge, MA: Harvard University Press, 1971.
Jacob, Kathryn. "How Johns Hopkins Protected Women from 'The Rougher Influences'." *AWM Newsletter* 6 (Summer 1976): 3–4.
Bushaw, D. "Mathematical Portraits–II. Christine Ladd-Franklin." *Mathematical Notes Washington State University* 20 (Feb 1977): 2–3.
Stevens, Gwendolyn, and Sheldon Gardner. *Women of Psychology: Pioneers and Innovators*, vol. 2. Cambridge, MA: Schenkman Publishing Co., 1982.
Green, Judy. "Christine Ladd-Franklin (1847–1930)." In *Women of Mathematics: A Bibliographic Sourcebook*, eds. Louise S. Grinstein and Paul J. Campbell, 121–28. Westport, CT: Greenwood Press, 1987.
Cadwallader, Thomas C., and Joyce V. Cadwallader. "Christine Ladd-Franklin (1847-1930)." In *Women in Psychology: A Bio-Bibliographic Sourcebook*, eds. Agnes N. O'Connell and Nancy Felipe Russo, 222–29. Westport, CT.: Greenwood Press, 1990.
Furumoto, Laurel. "Joining Separate Spheres—Christine Ladd-Franklin, Woman–Scientist (1847–1930)." *American Psychologist* 47 (1992): 175–182.
Russinoff, I. Susan. "The Syllogism's Final Solution." *Bull. Symbolic Logic* 5 (1999): 451–69.

Related manuscript materials:
Ladd-Franklin, Christine. Christine Ladd Franklin and Fabian Franklin Papers ca. 1900–1939. Rare Book and Manuscript Library. Columbia University. New York, New York.
Ladd-Franklin, Christine. Diaries, 1860–1873. Archives and Special Collections. Vassar College Library. Poughkeepsie, New York. Diary for 1866–73 also in Hudson River Valley Heritage Digital Collections.

Other sources: Johns Hopkins University Archives (Daniel Coit Gilman Papers and C. S. Peirce Papers); Vassar College Archives; Green and LaDuke, "Contributors to American Mathematics"; Rev. D. Sherman, DD, *History of the Wesleyan Academy at Wilbraham, Mass. 1817-1890* (Boston: The McDonald & Gill Co., 1893); E. B. Wilson, "Symbolic Logic," *Bull. Amer. Math. Soc.* 14 (1908): 175–91; J. L. Coolidge, "William Elwood Byerly – In Memoriam," *Bull. Amer. Math. Soc.* 42 (1936): 295–98; E. G. Boring, "The Society of Experimental Psychologists: 1904–1938," *Amer. J. Psych.* 51 (1938): 410–23; Hugh Hawkes, *Pioneer: A History of the Johns Hopkins University 1874–1889*, (Ithaca, NY: Cornell University Press, 1960); Stanley Rabinowitz, ed., *Problems and Solutions from The Mathematical Visitor 1877–1896*, (Westford, MA: MathPro Press, 1996); D. C. McCarty, "Optics of Thought: Logic and Vision in Müller, Helmholtz, and Frege," *Notre Dame J. Formal Logic* 41 (2000): 365–78; communication with James J. Tattersall, compiler of mathematical problems database, March 2010; WhoEast 1930 (Fabian Franklin); US Census 1850 NY, 1860 NH, 1860, 1870 CT, 1880, 1900 MD, 1910, 1930 NY.

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