

Chemistry at the University of Kansas

KU's first woman of chemistry, Mary Elvira Weeks

A history of our historian

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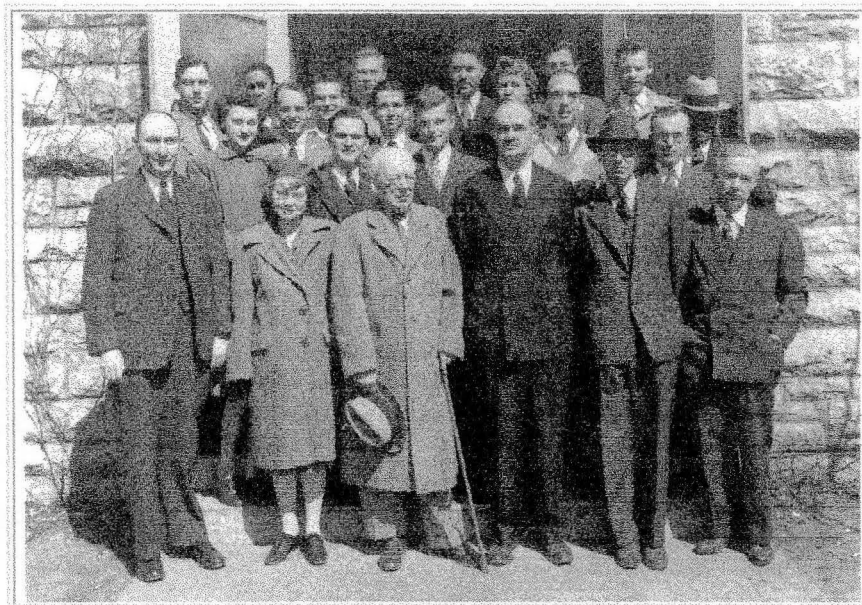
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The discovery of the more than 100 chemical elements evokes images of scientists engaged, through the ages, in a complex dance of detection. One legacy of their efforts is a tangle of historic tales—human tales of breakthroughs and defeats—scattered around the globe in early chemical journals, time-worn correspondence and old discarded textbooks.

Following this complex trail first began as a hobby sparked while she was visiting Thurnau's class in Faust here at KU.¹ The work required extensive correspondence, tedious reading, and painstaking compilation of information. Eventually the hobby became one of the most read chemistry books in the world and certainly one of the most read publications by a KU faculty member. Entitled *Discovery of the Elements*, it was said to be the first connected narrative of how scientists unraveled the mysteries of matter.² The author was Mary Elvira Weeks, our first female chemistry Ph.D. and our first female faculty member.

Miss Weeks' book was first published in serial form by the *Journal of Chemical Education*. Because of the heavy demand for reprints, the articles were published in book form in 1933. The book was eventually published in a number of other languages, with Miss Weeks, who could read German, French, Italian, Spanish, Swedish, Russian and Japanese, among others, involved in translation.¹ By 1968, the seventh edition of the book—which chronicled the discovery of 94 elements between 1524 and 1964—had been published.

Chemistry Staff, March 1944
Front row only (left to right): Brewster, WEEKS, Dains, Taft, Davidson, Stratton
Photo: Chemistry Archives



So what is the tangled human tale behind our historian of chemistry?

Miss Weeks probably came by her desire to document history naturally. In the 1870s near Lake Winnebago, Wisconsin, Elvira's maternal grandmother, Elizabeth Yates Richmond, collected Indian folklore and translated it into ballads. She corresponded with such eminent poets of the period as Henry Wadsworth Longfellow and John Greenleaf Whittier, who expressed great appreciation of her work. Two of these ballads were later successfully set to music by Mary Elizabeth Weeks, Elvira's mother.³

Mary Elvira Weeks was born on a farm near Lyons, Wisconsin, in 1892—the year of the first American Chemical Society meeting in Rochester, New York. The nineteenth

century had seen a growth of interest in science by women and, as the century came to an end, it became more

and more possible for women to obtain a formal scientific education.⁴ Miss Weeks, who was always interested in science,¹ received an undergraduate degree from Ripon College with A.F. Gilman (1913) and a master's degree from the University of Wisconsin--Madison with J. H. Mathews (1914).⁵ Mathews was one of the early researchers in photochemistry in the United States. At the University of Wisconsin during these years, women constituted about 20 percent of chemistry course enrollments.⁶

While Miss Weeks was growing up in Wisconsin, much was happening in Chemistry at KU. In *50 years in Bailey Chemical Laboratory*, Robert Taft reported that "...enrollment at the University was about 1,000, and it was rapidly developing a reputation as one of the leading educational institutions of the trans-Mississippi West. Training chemists for the mines of the West was an important feature of the University in that day."⁷

Bailey Chemical Laboratory became the new home of the Department in 1900, and the Kansas City Section of the American Chemical Society was organized with E.H.S. Bailey as the first chairman. KU's first Ph.D. degree in chemistry went to Hamilton P. Cady in 1903. Shortly thereafter, Cady isolated helium in natural gas, which is considered one of the great finds of the twentieth century. Weeks would later chronicle this historical event in her book.

From 1914-1921, Miss Weeks was busy teaching high school chemistry and working in the chemical industry at New Jersey Zinc in Franklin, New Jersey, and the Carborundum Company in Niagra Falls, New York.³ At KU, Franklin Burnett Dains, who had been on the Washburn College staff in Topeka for many years, was appointed an associate professor of chemistry. Throughout his career at KU, Dains collected and maintained an extensive library of lithographs, portraits of chemists, tracts, books and other items related to the history of chemistry. It was reported that one of the first courses on the history of chemistry was taught by Dr. Dains, whose lectures were said to be superbly illustrated with about 2000 lantern slides.⁸ Dains and his collection would impact the career of our future historian.

The end of World War I triggered a growth period for the University. KU's enrollment was a record 4,226 students. Cady had been promoted to chair of the Chemistry Department in 1920, a position he held for 20 years.⁷

In 1921, during the time period when many women were being displaced from industry positions by returning veterans,⁵ Weeks came to KU as an instructor at a salary of \$1,900 per year. She taught quantitative analysis for 22 years. Doris Brewster Swift--author of *Life on Mississippi Street* and daughter of Ray Q. Brewster, who would follow Cady as chair of the Department--gave this summary of her childhood memories of Miss Weeks:

Elvira was most often described as extremely timid and shy. She lived with her mother in a small yellow bungalow with a well kept lawn and hedge and brightly colored flowers. The bungalow was located on the northeast corner of 18th and Mississippi Streets, just south of the campus. Her house was the most colorful one on the block--in contrast to her lack of color in clothing, which was typical of the period. Her house was several doors down from the Brewster home and catty-corner from Miss Daum, a librarian at Lawrence Public Library who shared common interests. Miss Weeks never had a car and either walked or rode the bus. When Elvira's mother was alive, the Brewsters sometimes took them to church. Miss Weeks was the first person on the block to have a radio and frequently invited the neighbors in to listen to important broadcasts.

About half way through this decade Neil Gordon, founder of the Gordon Research Conference, started the American Chemical Society's *Journal of Chemical Education* (1924). In an article written by Weeks about Dains for *Industrial and Engineering Chemistry*,⁸ she noted that:

Dains believed the founding of the American Chemical Society's Division of Chemical Education and its journal to be one of the most far-reaching advances in the teaching of chemistry...he often searched his library for illustrative materials for frontispieces and for the articles of other contributors and wrote careful abstracts of historical articles selected with great discrimination.

Historically, the number of women receiving doctorate degrees in chemistry reached a maximum nationally in 1929 when 10 percent of Ph.D. degrees were awarded to women, dropping to 5 percent by 1933 and reaching a minimum of 2 percent in the 1940s.⁵ At KU, under Cady's tutelage, Weeks received KU's twelfth chemistry Ph.D.

degree in 1927-- the first granted to a female. Her dissertation topic: *The role of hydrogen ion concentration in the precipitation of calcium and magnesium*. That same year, Weeks was appointed as KU's first female assistant professor of chemistry.

Obviously, women didn't disappear from chemistry in the 1930s. Rayner-Canham's research indicated that women began playing a more peripheral role, gravitating toward more female-friendly sub-disciplines of chemistry, *i.e.*, atomic science, biochemistry and crystallography.⁵ In the early years of her career, Weeks published three laboratory-based articles in her area before switching to what was surely a less competitive, female-friendly area--the history of chemistry. Still, women in this period needed strong mentors,⁴ and Weeks, Gordon and Dains were well-positioned to be collaborators in this area.

Taft reflected on the time period 1930-1935 noting that "...economic disaster, drought, floods, dust storms of unprecedented magnitude, temperature so high that none in the recorded history of Kansas approached them, were all to play their parts in University life and in the life of the workers in Bailey Laboratory."⁷

The New York stock market crash of 1929 plunged the country into the Depression, but this was Elvira's most productive period. She published 34 journal articles-- 33 on the history of chemistry--and two books, *Discovery of the Elements* and *A Laboratory Manual of Quantitative Analysis*. Taft reports "...the Department established a photographic laboratory in Bailey Hall in 1930. The making of lantern slides, the photo-duplication of bibliographic material, and the facsimile reproduction of the results of investigation furnished ample work to warrant this effort."⁷ It was in this laboratory that Oren Bingham was able to photo-duplicate Dains' collection of lithographs for inclusion in the first edition of *Discovery of the Elements* published in 1933. Neil Gordon was the editor.

During the severe heat and drought of 1934 and the Dust Bowl of 1935, Miss Weeks published two more revised editions of her book. The University's peak enrollment before World War II was reached in the fall of 1937--5,600 students.⁷ Elvira was promoted to associate professor that year at a salary of \$2,025 and served as an abstractor for the *Journal of Chemical Education* from 1937-1940.

Weeks would write six more history articles and publish the fourth edition of her book during the 40s. On another front, Missouri industrialist and chemist Sam Cox Hooker started the Hooker Collection at Central Methodist University--a small college in Fayette, Missouri--appointing Neil Gordon as director. The journal *Record of Chemical Progress* was founded under the editorship of Neil Gordon by the Friends of the Hooker Scientific Library. The Hooker Collection was totally comprised of volumes on chemistry and related sciences. In the Department in 1940, Weeks' mentor, H.P. Cady, stepped down as chair. Within a year, Dains had a stroke and left the Department. Two years later, Cady had a breakdown and died at age 69.⁷

When Neil Gordon moved to Wayne University in Detroit, Michigan (which later became Wayne State University), in 1942 to become the new chairman of the chemistry department, the Hooker Collection--by then encompassing 21,000 items-- was also moved with the financial assistance of the Kresge Foundation and the local chemical community. Also that year the journal *Record of Chemical Progress* became the official organ of the American Association for the Advancement of Science Section c (chemistry).

Rayner-Canham et al. reported that the competitive environment in the sciences was heating up and science was becoming more discouraging to women.⁵ Weeks left KU and joined the Kresge-Hooker Scientific Library in Detroit in 1944 as a research associate of scientific literature and served as an associate editor for the *Record of Chemical Progress*. Although very productive with an international reputation in her area, Elvira had not attained the rank of full professor while at KU. Weeks was eventually replaced at KU by analytical chemist David Hume, after he was released from his position at Oak Ridge. Weeks wrote two more articles in Detroit, and in 1948, the fifth edition of her book was published. The following year, Neil Gordon died at the age of 67, and at KU, Dains died at age 79 and Hume left for MIT.

During the 1950s, Elvira Weeks, now age 58, wrote one book and an article. She co-wrote *A History of the American Chemical Society: 75 Eventful Years (1870-1947)* with Charles Allen Browne in 1952. The sixth edition of her book was published, which for the first time included a chapter by another author-- Henry M. Leicester. Miss Weeks retired from the Kresge-Hooker Scientific Library in 1954, but remained active as associate editor of the *Record of Chemical Progress* until publication ceased in 1971. She also served as consulting editor for *Chymia* from 1956-1967, when it ceased publication. *Chymia* was an annual journal which presented studies in the history of chemistry, under the editorship of Leicester.

An Exhibit of Chemical Substances Mentioned in the Bible
Bailey Hall 1943



Dexter Chemical established the American Chemical Society Dexter Award in 1956 to recognize an outstanding career of contributions to the history of chemistry. When notified in 1967 that she had been selected to receive the Dexter Award, Elvira Weeks wrote "...in comparison to others who had received the Dexter Award I feel humble and unworthy...I would be happy to see this prize awarded instead, as an encouragement, to some younger person who is still actively engaging in research in the history of chemistry."⁹ Martin Levey, then chair of the ACS Division of History of Chemistry, responded "...we have decided that you most deserve the award and, in the best Emily Post tradition, you must accept it."⁹ Due to ill health, Weeks was unable to attend the awards ceremony in Chicago; however, Levey traveled to Detroit for the presentation. In 1968, Weeks and Henry M. Leicester published a completely revised seventh and final edition of *Discovery of the Elements*.

Mary Elvira Weeks died at age 83 in Detroit on June 20, 1975. Some of her colleagues were more esteemed as scientists, with laboratory-based discoveries and inventions to their credit. Miss Weeks' scientific contributions reside in what she did for the advancement of the history of science and the education of scientists. She is one of the most distinguished members of our KU Chemistry family.

So, where are we today?

In keeping with the national trends of the time, no other female would be appointed as professor of chemistry at KU until Kristin Bowman-James in 1975. In their article *Women in the ranks*, Everett et al. report that in ACS-approved departments nationwide women comprised only 5.3 percent of faculty during this period.¹⁰ Kristin is the first female in our history to attain the rank of professor and our first female chairperson --1987 and 1995, respectively. Historically, by 1993, women comprised 11.7 percent of faculty nationwide, but only 2 percent of

department heads. Currently the Department has four female professors--Kristin Bowman-James, K. Barbara Schowen, Cynthia K. Larive and Janet Bond Robinson.

Elvira Weeks gave funds and her files to the Wayne State University Science Library. Part of her files (personal papers) were given to the Wayne State University Archives in 1981 by the Head of the Science Library. The University Archives is housed in the Walter P. Reuther Library of Labor and Urban Affairs.

The Dains Collection is housed at KU's Spencer Research Library / University Archives.

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