

ST. ELMO BRADY (1884-1966). THE FIRST AFRICAN AMERICAN CHEMISTRY DOCTORATE RECIPIENT

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Supplemental Material

Introduction

In this paper, we describe a significant amount of new information about the life and accomplishments of St. Elmo Brady (Figure 1), the first African American to receive a Ph.D. degree in chemistry in the United States (1-4). Brady carried out original research in the field of organic chemistry, and played a key role in the development of chemical education at four well-known HBCUs (Historically Black Colleges and Universities): Tuskegee University, Howard University, Fisk University and Tougaloo College.

St. Elmo Brady spent his life trying to address the underrepresentation of African Americans in the U.S. chemical workforce (5-9). Pioneers are of necessity remarkable people, and Brady is no exception; he and his life's work deserve to be remembered. Collins has noted that African-American students can usually name George Washington Carver (ca. 1864-1943) as a famous African-American scientist, but few could name any oth-

ers (10). We hope the current paper will help to bring St. Elmo Brady into sharper focus and greater recognition.

Ancestry

As is common for many African-American families whose ancestors were brought forcibly to the United States, St. Elmo Brady's paternal ancestry can be traced back only two generations (Figure 2). Slaves were usually counted but not named individually in US censuses conducted before the Civil War.

St. Elmo Brady's grandfather, Joseph Brady, was born into slavery in Maryland around 1816. He was not mentioned by name in the 1840 US census, but in the 1850 census he was listed as a 34 year old freedman who was working in Louisville, Kentucky, as a steward (11). On February 13, 1852, he married Mary Jane Bland (12, 13). In the 1860 census, Joseph's occupation was listed as a steward on a steamboat, and his real estate

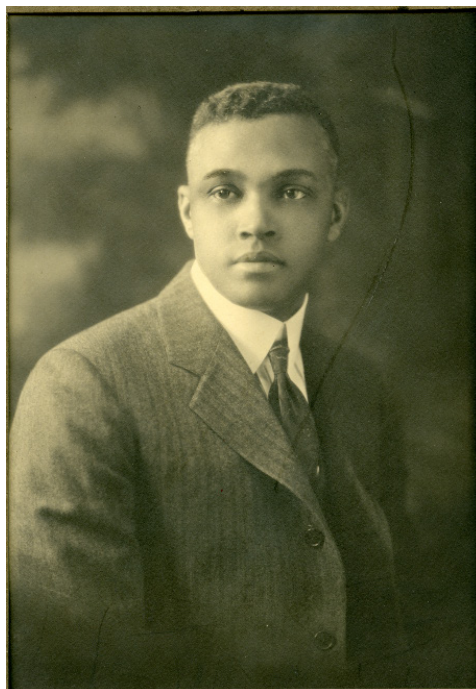


Figure 1. St. Elmo Brady, ca. 1910.

holdings were valued at \$1800 and his personal estate at \$500. In the same 1860 census Mary's age was given as 26 and her race as mulatto (14); by that time Joseph and Mary had two sons, William (age 5) and Thomas (age 2), both listed as mulatto (15). Mulatto was a race designa-

Alexander Brady (then 22), who was to become St. Elmo's father, was listed in that census as working for a tobacco factory. Mary continued living with Estella and Washington Ward: they were still in Louisville during the 1910 census, but had moved to Los Angeles, CA, by

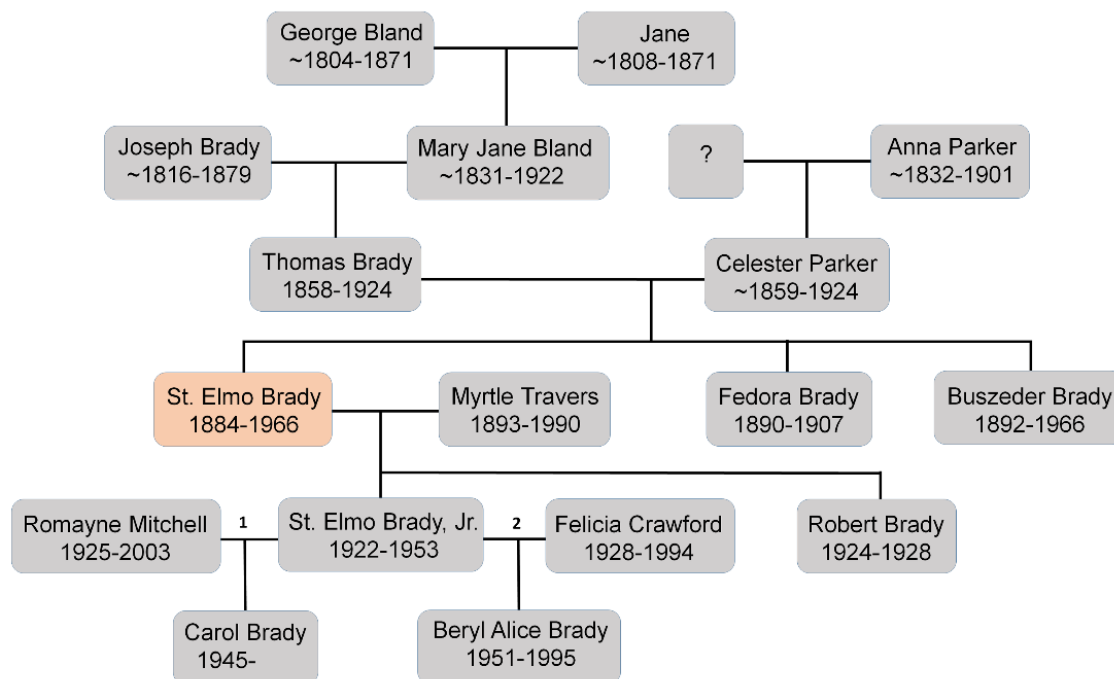


Figure 2. A portion of the family tree of St. Elmo Brady. When tildes appear in front of the birth year, it indicates uncertainty, usually because of conflicting information in multiple US census data (17).

tion in US censuses from 1850 to 1920: the term was defined as “quadroons, octoroons and all persons having any perceptible trace of African blood,” quadroons being persons who were one-quarter black by descent. We can trace Mary Jane Bland back one more generation: in the 1850 US census, she is listed as living with her father, George Bland, a carpenter, her mother Jane, four brothers and one sister. Because George Bland is listed as owning \$1200 in real estate, he must have been a freedman (16).

By the 1870 census the family had grown to include Estella (born in 1862), James (born in 1865), Minnie (born in 1867) and Clarence (born in 1869). Joseph's real estate holdings had increased to \$3000 and his personal estate remained valued at \$500. Joseph died in Jefferson, KY, on July 16, 1879 (18).

At the time of the 1880 census, Mary Brady and her family were living in the Louisville home of her eldest daughter Estella and her husband Washington Ward; the other Brady children in the home were Thomas, James, Minnie, Clarence, and Wilford (age 7). Thomas

1920. Mary died in California on January 16, 1922 (19).

Thomas Brady continued work for a tobacco factory for at least 40 years; in the 1920 census he was a tobacco stemmer, a farmworker who removes stems from tobacco leaves. Thomas married Celester Parker Brady on March 27, 1884 (20). Celester, born March 28, 1859 (21, 22), was more educated than Thomas: she had graduated from high school in Louisville (23). Celester's mother was Anna Parker, already widowed in 1880 (21) and living with Thomas and Celester in 1900 (22).

St. Elmo Brady was born in Louisville, Kentucky on December 22, 1884. Family lore has it (23) that Celester named him after the protagonist of one of the most popular novels of the 19th century, *St. Elmo*, which had been written by the Georgia native Augusta Jane Evans (1835-1909) in 1866. It was not uncommon for young men to be named St. Elmo after the hero of the novel, whose sales in the late 19th century were exceeded only by *Uncle Tom's Cabin* (24). Movies and plays were

based on the novel, whose author has been called the American Brönte.

Thomas and Celester had two other children, Fedora and Buszeder (Figure 3) (25).



Figure 3. Buszeder Brady Ragland in the 1920s. Courtesy of Carol Brady Fonvielle.

Early Education

St. Elmo Brady received his early education in Louisville, graduating from Central Colored High School in 1903 with honors (26-31). At the time, this was no small accomplishment. In 1910, the African-American illiteracy rate in Kentucky was 27.6% compared to 10% for whites. In 1916, there were nine high schools for African Americans in the entire state of Kentucky, and Central Colored High School in Louisville was the oldest (started in 1874) and the best. The high school was well-organized and offered four years of secondary work with an emphasis on industrial training. A contemporary evaluation noted that “the course is modern and compares favorably with that of the white high schools of the city. ... The equipment for teaching science is good” (32). However, a more modern appraisal noted that “Louisville’s black schools were located in old structures, usually buildings that whites had abandoned. These ‘schools’ had no libraries or gymnasiums and often no playgrounds. Black educators and civic leaders complained for years about the deplorable building that housed Central High, while the white high schools—Male, Manual, and Female—all enjoyed modern facilities” (33). Brady was fortunate to have had the opportunity to attend a four-year high school that offered a science curriculum.

In the early 20th century, few Americans of any race continued their educations past high school: in 1910 only 13.5% of those over 25 reported completing high school (34), and only 2.3% of the entire population of 18-24 year olds were enrolled in a college in 1904-1905 (35). For African Americans, the corresponding percentages must have been considerably smaller.

Fisk University: 1904-1908

It has been noted that young African-American scientists thrive in the supportive environments of HBCUs (5). At the time Brady decided to continue his education past high school, only three HBCUs—Howard University, Fisk University and Meharry Medical College—had the students, faculty, equipment and support adequate to warrant that designation (36). In 1904 Brady elected to attend Fisk University in Nashville, TN.

The Fisk Free Colored School in Nashville, TN, had been created under the auspices of the Freedmen’s Bureau, a government agency established in 1865 to provide food, shelter, clothing, medical services, land, and other assistance to former slaves and poor southern whites (37-40). After Fisk was dedicated on January 6, 1866, enrollment increased rapidly from 200 in February 1866 to 900 in May. In 1867 the Tennessee General Assembly enacted legislation in support of free public education; the resulting demand for qualified teachers, especially African-American teachers, prompted the Fisk Free Colored School to incorporate on August 22, 1867, as Fisk University and switch its emphasis from primary to higher education. It is the oldest university in Nashville, Vanderbilt University having been founded in 1873. Among Fisk’s alumni was W. E. B. Dubois (1868-1963). An 1888 graduate, Dubois was the first African American to receive a doctorate in sociology and the second African American awarded a research doctorate; he was one of the founders of the National Association for the Advancement of Colored People (NAACP) (41).

By 1914-1915, a few years after Brady attended Fisk, the university comprised (as was common at the time) an elementary school (112 students) and a secondary school (169 students) as well as the college (188 students) (42). Those taking the courses (or pursuing a major, as we would call it today) in science numbered 77 and constituted the largest component of the college level students. They had a building of their own—Chase Hall.

While at Fisk, Brady was a student of Dr. Thomas W. Talley (1870-1952) (43, 44). Talley, an alumnus of

Fisk (AB, 1890; MS, 1892), taught chemistry and biology from 1899 until his retirement in 1938, and was the chair of the chemistry department for 25 years. Relatively late in his life, Talley earned a Ph.D. degree in 1931 for work carried out with Warren C. Johnson (1901-1983), dean of the division of Physical Sciences and professor in the department of Chemistry at the University of Chicago. Talley was also a singer and a folklorist: he published a popular collection of African-American folksongs, *Negro Folk Rhymes (Wise and Otherwise)*. Brady commented, "I do not remember Thomas Talley for the chemistry he taught me, but for the encouragement and inspiration he gave me to go on" (28). When Brady was Professor and Head of Chemistry at Fisk, he founded the Thomas W. Talley lecture series that brought many distinguished chemists to Fisk (29).

Brady's activities at Fisk University extended well beyond chemistry. Newspaper reports show he acted in a play (*The Merchant of Venice*) staged by the Fisk University junior college class. Brady played Gratiano, a witty and fun-loving character who loves to talk and is almost impossible to shut up; a review of Brady's performance said he played his character well (45). Brady was also the editor for several years of the *Fisk Herald* (46), a monthly college journal published by the literary societies of Fisk University, started in 1883. Brady was a member of the Fisk Glee Club (47), perhaps not surprising given the interest of his mentor, Talley. And Brady was a member of Fisk's football team and was named to an African-American All-American team (48). He graduated from Fisk with a B.S. degree in 1908 *Magna cum Laude* and was one of several speakers at the commencement ceremony (49).

Tuskegee Normal and Industrial Institute: 1908-1913

After St. Elmo Brady graduated from Fisk, he accepted a faculty position (Figure 4) at the Tuskegee Normal and Industrial Institute (26, 50). Founded by the Alabama State Legislature in 1880, the institution had opened in Tuskegee, AL, as the Tuskegee State Normal School on July 4, 1881, in a ceremony presided over by its first president, Booker T. Washington (1856-1915) (51-53). The purpose of normal schools was to train teachers; from the beginning Washington had three objectives for Tuskegee (54):

First, the school was to concentrate on training students as teachers and educators. Second, many Tuskegee students were taught crafts and occu-

pational skills geared to helping them find jobs in the trades and agriculture. And finally, Washington wanted Tuskegee to be "a civilizing agent:" as such education took place not only in the classroom but also in the dining hall and dormitories.



Figure 4. St. Elmo Brady at Tuskegee University around 1910. Courtesy of Carol Brady Fonvielle.

As has been noted (55),

Hampton and Tuskegee are the only [HBCU] institutions with facilities comparable to those of the agricultural colleges for white pupils. Both of these institutions have carried on remarkable campaigns for the improvement of rural conditions. Practically all the pupils in both schools receive some instruction in the theory and practice of soil culture. Those who specialize devote half their time to farm practice.

Tuskegee Institute became independent of the state in 1892 through an act of the Alabama legislature (56).

Washington's imprint on the institution was deep (57):

The genius of Booker T. Washington gave to the institution world-wide fame as the exponent both of the educational value of manual labor and the correlation of academic subjects with industrial training. Its community and extension work is worthy to be ranked among the important educational activities of the times. The institution, officered and taught from the beginning by colored men and women, is to that extent the most striking achievement of the Negro race and undoubtedly the greatest factor in overcoming prejudice against the education of the race.

Soon after joining Tuskegee as an instructor in chemistry, St. Elmo Brady developed close personal ties with Washington (Figure 5) and also with another famous Tuskegee faculty member, George Washington Carver

(Figure 6) (ca. 1864-1943). Brady was later quoted as saying (26),

I had the extreme privilege of knowing personally Dr. Washington, the great educator, and Dr. Carver, the beloved saint and great scientist. It was the friendship of these two men that showed me the real value of giving one's self and effort to help the other fellow.



Figure 5. Booker T. Washington. Gift of Washington to Brady. Courtesy of Carol Brady Fonvielle.



Figure 6. George Washington Carver. Gift of Carver to Brady. Courtesy of Carol Brady Fonvielle.

In 1915-1914, there were 1338 students on the Tuskegee campus (57); of these, 900 were elementary

students, 366 were secondary students, and 72 were special students (the latter were non-degree students who took courses in only one subject area such as nursing or farming/agriculture). An additional 230 pupils were enrolled in the Children's House, which was used as a practice school. There were no college students, because at that time Tuskegee was an industrial school that focused on training in trades, especially in agriculture. When he arrived at Tuskegee Institute, Brady was one of a two-person Science Division in the Academic Department, with the other being the head of the division, John W. Hubert (1874-1945), who was a graduate of Atlanta Baptist College (now Morehouse College) and the University of Chicago (58, 59). At that time, Carver was not listed as a member of the Science Division; instead, he was the Director of the Agricultural Instruction and Experiment Station Department.

By 1913, five years after his arrival at Tuskegee, Brady had become the head of the Science Division, which had grown to include five faculty members, one of whom was now Carver (60). Carver was still the Director of the Agricultural Instruction and Experiment Station Department, but had some formal connection with the Science Division, probably to give students doing research with him access to equipment and space (61). In addition, while Brady was head, the two-year chemistry curriculum was modified to resemble more closely the sequence at major universities such as the University of Illinois. Courses in painting, cooking, laundering, photography, and nurse training were replaced with courses in qualitative and quantitative analysis (59, 62, 63). At Tuskegee, Brady started what was to be his life's work—the improvement of chemistry departments serving African-American students.

The University of Illinois: 1913-1916

In 1913, St. Elmo Brady took a leave of absence from the Tuskegee Institute (64) and went to Champaign, Illinois, at age 29, to attend graduate school at the University of Illinois. Brady knew from George Washington Carver that African Americans could get advanced degrees; Carver received his BS (1894) and MS (1896) degrees in agricultural science from Iowa State Agricultural College (later Iowa State University) (65). Brady may also have been inspired by W. E. B. Du Bois, a Fisk graduate and the other great leader (along with Brady's friend and colleague Booker T. Washington) of the African-American community in the late 19th and early 20th century. As noted on the NAACP website (41):

“All of [Dubois’s] efforts were geared toward gaining equal treatment for black people in a world dominated by whites and toward marshaling and presenting evidence to refute the myths of racial inferiority.”

The 186 chemists received their doctorate degrees from a total of 61 different universities with Wayne State University leading all others with 13, followed by the University of Chicago with 12, Ohio State University with 9, and Howard and Iowa State

Table 1. Student Enrollment and Degrees Granted, University of Illinois 1900-1925.

	African American	Total	African American Degrees				
Year	Enrollment	Enrollment	AB	BS	Masters	Ph.D.	Total
1900	2	2505	1				1
1901	5	2932					
1902	4	3288					
1903	9						
1904	19	3729		1			1
1906			1				1
1907				1			1
1908			2				2
1909			1				1
1910			2	1	1		4
1911				1			1
1912			1	1	1		3
1914			3	2	1		6
1915			1	1			2
1916			2	1		1	4
1917			1	1		1	3
1918			3	3			6
1919	48	7157	3		1		4
1920			2	3			5
1925	68	10710	8				8

We will never know exactly what led Brady to Illinois, but Raynard Kington, the first black president of Grinnell College (66) noted that

A number of Midwestern state universities such as Illinois were known to be open to educating African Americans in their graduate programs when the vast majority of universities elsewhere in the US would not.

Of African Americans receiving doctorates in chemistry up to 1969 (67),

Universities with 7 each [and Illinois with 5]. ... While the Big-10 universities accounted for 43% of the bio-scientists in the previous chapter, only 46 or 24.7% of the chemists received their doctorates from Big-10 universities.

It is worth noting that, at the time Brady came to Illinois, no African American had earned a Ph.D. in chemistry in the United States. Brady would be the first.

The University of Illinois at Urbana-Champaign (UIUC) is one of the original 37 public land-grant institu-

tions created through the Morrill Land Grant College Act of 1862 (68-70). Originally called the Illinois Industrial University, the institution was formed by legislative action of the State of Illinois on February 28, 1867 (71, 72). The Illinois Industrial University officially opened for classes on March 2, 1868, and the Department of Chemistry and Natural Science was one of the original six departments of the University. Only a handful of U.S. universities featured chemical laboratories at the time, but Illinois had one right from the start because its curriculum emphasized applied science, not the traditional gentleman's Greek and Latin. John Milton Gregory (1822-1898), Illinois Industrial University's first president, declared in his very first annual report (73), "It is especially important that an appropriation should be made to fit up, at once, a chemical laboratory."

The name of the institution was changed to the University of Illinois in 1885 and the Graduate School was organized in 1895. The first doctorate in chemistry and one of the first two doctorates in any field awarded by the University was earned by William Maurice Dehn (74)—who received his Ph.D. degree in 1903 and went on to a career as a professor at the University of Washington (75). From 1903-1913, 18 men earned doctoral degrees in chemistry from the University of Illinois (76); the Illinois chemistry department would award its first Ph.D. degree to a woman in 1918.

Some general information about the number of Af-



Figure 7. St. Elmo Brady, ca. 1925.

rican Americans attending the University of Illinois as a whole, and the degrees they obtained, is given in Table 1 (77). Brady was far from the only African-American student on the Illinois campus, but the percentage of African-American students on the campus was tiny:

0.67% (48 out of 7157) in 1919. The highest percentage of African Americans on the campus over the period 1900-1939 occurred in 1929: 0.95% (138 out of 14594).

When Brady (Figure 7) entered the graduate program at the University of Illinois, he faced both intellectual and social challenges. Years later at Fisk University Brady remarked (26) in reference to his entering class of graduate students: "they began with 20 whites and one other and ended in 1916 with six whites and one other." Brady's remark suggests that the Illinois graduate program was difficult, and prejudice toward him as an African American could only have made it even more so. But he was up to the challenge, and he did have at least one advantage. Brady was older than the average graduate student in chemistry (29 years old) and came to do research after working his way up to head a chemistry department at a well-regarded HBCU. As a result, he was likely more motivated and knowledgeable than most of the other graduate students in his entering class.

But Brady also faced significant social challenges (78). Jim Crow covenants restricted the ability of non-Caucasians to rent or own property. At the time, most African-American students the University of Illinois had to live in off-campus housing, which usually meant in the segregated African-American part of town, commonly referred to as the North End (79, 80):

This section is bounded on the north by Bradley Street, on the east by Goodwin Street, on the south by Park Street, and on the west by the Illinois Central tracks. The district defined above covers an area of about one square mile. ... The African-American residential area of Urbana-Champaign was considered the poorest, most undesirable section of the two cities. This area consisted of small, dilapidated homes, which were typically on overcrowded blocks. White real estate agents and homeowners discriminated against African Americans, forcing the majority of African-American residents to live in a confined area, which caused residential segregation. Scarcely did African Americans live outside of the defined "Negro" area.

It is not clear where Brady lived in 1913-1915, but in 1916 he was a boarder at 1202 W. Main St., Urbana (81). At the time, this block of Main Street was on the northern edge of campus, one block from the baseball field and on the northwest corner of Main and Goodwin. It was definitely not in the North End. The house at 1202 must have been fairly large, because in 1907 the Tau Lambda fraternity was temporarily located there (82), and in 1908 the building was occupied by a Catholic organization, the Spalding Guild (83). The 1910 US Census shows that

the house nearby, 1206 W. Main, was owned by William Brewer, an African American, and that the Brewers were the only African Americans living in the area (84). From 1912-1916, the Champaign Urbana City Directories (85-87) list William Brewer and his family living at the same address as St. Elmo Brady, 1202 W. Main; Brewer was a chef at the Beardsley Hotel in Champaign (88).

There were two African-American churches in Champaign at the time Brady attended graduate school: Bethel African Methodist Episcopal Church and Salem Baptist Church. We have no direct evidence that Brady belonged to either of these churches (23), but he was known at both. The Bethel African Methodist Episcopal Church, which had been founded in 1863, erected its first building on the site it still occupies, 401 E. Park, Champaign. In 1915 and 1916, local newspapers printed articles about talks that Brady gave at the church, one (89) on "The Education of the Negro in the South," another (90) in which he acted as the keynote speaker for an evening reception honoring the church pastor, Rev. Edward G. Jackson. In November, 1915, Brady spoke at Salem Baptist Church, founded in 1866 and located at 500 E. Park, Champaign. Brady's talk, given in commemoration of Booker T. Washington shortly after his death, was entitled "His Work at Tuskegee." (91).

The segregation that pervaded the city did not extend to the Department of Chemistry. Figure 8 shows Brady at the University of Illinois working alongside white students. Brady never mentioned separate laboratories or segregation of any kind, unlike one of his later co-workers at Fisk University, Samuel P. Massie (1919-2005), who had received a Ph.D. in chemistry in 1946 under Henry Gilman at Iowa State University. As noted in Massie's obituary (92),

In 1941, Iowa State University accepted him in its doctoral program in organic chemistry but would not allow him to live on campus or use the same science lab as the white students. "The laboratory for the white boys was on the second floor next to the library," Dr. Massie recounted. "My laboratory was in the basement next to the rats. Separate but equal."

Brady's Ph.D. thesis contains the following acknowledgement (93):

The author wishes to take this opportunity of expressing his indebtedness to Dr. C. G. Derick of the Department of Organic Chemistry, who suggested to me the nature and general scope of this research, and by his wise counsel and ever courteous treatment has made possible the successful completion of this study. Thanks are also expressed to my associates in the Organic Laboratory for their ever ready assistance and as a recognition of the many pleasant moments spent together in the work.

This acknowledgement indicates that Brady was well-received by many of his fellow graduate students.



Figure 8. St. Elmo Brady in a laboratory in the Chemistry Building (later Noyes Laboratory) at the University of Illinois. Courtesy of the University of Illinois Archives.

In 1914, Brady became the first African American to be admitted to the chemical honor society Phi Lambda Upsilon and to be inducted into the science honorary society Sigma Xi. Induction into these fraternities indicated that Brady socialized with his white colleagues outside of the laboratory.

After starting graduate work in the summer of 1913, Brady completed his M.A. degree in 1914 under the direction of Clarence George Derick, Sr. (1883-1980), with a dissertation "The Scale of Substitution in Organic Electrolytes: Oxygen Influence in Normal Monobasic Paraffin Acids" (94). Derick had obtained his Ph.D. degree in 1910 at the University of Illinois under the department head William Albert

Noyes (1857-1941), and served as an assistant instructor and associate (a faculty rank below assistant professor) from 1908 until 1916. Brady's research, which extended previous work by Derick and others, was aimed at settling a scientific disagreement between Derick and the eminent Harvard chemist Arthur Michael (1853-1942) (95). Derick and Michael disagreed on how the acidity of carboxylic acids was affected by replacing hydrogen atoms on the carbon chain with other chemical groups (96, 97).

In his M.A. research, Brady wanted to compare the acidity of pyrroacemic acid (i.e., 2-oxopropanoic acid),

$\text{CH}_3\text{C}(\text{O})\text{COOH}$, to propionic acid (i.e., propanoic acid), $\text{CH}_3\text{CH}_2\text{COOH}$. He developed techniques to purify the pyrrocemic acid and to measure its acidity conductometrically. He was unable to make useful comparisons of his results to those published for propionic acid because the latter, after re-analysis, were insufficiently accurate. Brady noted (93, 94) that “As time would not permit of my measuring this acid the ‘Place Influence’ of the oxygen atom cannot be calculated.”

After he completed his M.A. degree, Brady was awarded two fellowships to continue his studies toward a Ph.D. degree (98-100), one for the 1914-15 academic year for \$350 and another for the 1915-16 academic year for \$400. These payments were typical of 10 month fellowships for chemistry graduate students at the time; for comparison, in the same years Derick’s 10 month salary was \$2300 (101).

During his time at Illinois, Brady published two abstracts of research results presented at national meetings of the American Chemical Society. Very likely, Brady was the first African American to present a talk at a meeting of the ACS. The first paper (102), “The Ionization Constants of Certain Ketoparaffine Monobasic Acids,” which was presented at the spring 1915 national ACS meeting in New Orleans, echoes the title of Brady’s M.S. thesis. The second paper (103), “Preparation and Characterization of ϵ -Acetylcaproic Acid,” which was presented at the spring 1916 national meeting in Champaign-Urbana (Figure 9), concerned one of the compounds Brady studied in his Ph.D. work. Brady presented another paper at the Champaign-Urbana meeting, but in this case he was the sole author. In this paper (104), “The Behavior of β -Phenoxy Ethyl Bromide in the Wurtz-Fittig Synthesis,” he reported that the reaction of the title compound with sodium produced ethylene, sodium phenoxide, and α,δ -diphenoxybutane.



Figure 9. Souvenir ashtray from the national American Chemical Society meeting held in Champaign-Urbana, April 17-21, 1916. Courtesy of a private collector.

Brady also collaborated with University of Illinois professor George Denton Beal (1887-1972) on the paper (105) “The Hydrochloride Method for Determination of Alkaloids” published in the *Journal of Industrial and Engineering Chemistry*. This paper was Brady’s first on the chemistry of natural products, a research topic that occupied him for the rest of his scientific career. In it, Brady reported the development of a new assay method for alkaloids extracted from conium seed, tobacco, and colchicum root.

Brady completed his Ph.D. thesis, “The Scale Influence of Substituents in Paraffine Monobasic Acids: The Divalent Oxygen Atom,” on May 6, 1916 (Figure 10) (106). In his Ph.D. research, Brady extended his M.A. thesis work on the acidity of straight-chain carboxylic acids in which a pair of hydrogen atoms was replaced with an oxygen atom to give a keto acid. Brady’s research resulted in a number of firsts, including new methods for preparing and purifying certain compounds, and clarifying the influence of functional groups on the acidity of carboxylic acids. Brady’s studies supported Derick’s view that the effect of the keto group on the acidity diminished monotonically with increasing distance from the carboxylic acid group, which contradicted Michael’s view that the influence was not monotonic. Brady stated (107): “Experimental evidence disproves Michael’s theory in every respect when applied to the ketone acids.”

Two other students who graduated from Derick’s group at about the same time are worth noting. Ray Washington Hess (1889-1856) submitted his Ph.D. thesis on exactly the same day as Brady—May 6, 1916—with exactly the same title as Brady’s thesis (108). The goals and experimental approaches in the two theses were similar but involved the synthesis and characterization of different compounds. Hess, who later published his thesis work (109), went into industry (110).

An even more remarkable contemporary of Brady’s was Edward Chandler (1887-1973) (111), who became the second African American to receive a Ph.D. in chemistry in the United States when he graduated from Illinois in 1917. Chandler also worked for Derick, and in 1916 he resided in the same boarding house as Brady. Chandler chose to go into industry in the Chicago area after he graduated. He specialized in triphenylmethane dyes and synthetic drugs, working for the dye firm Dicks, David and Heller Co. and the pharmaceutical manufacturer Abbott Laboratories. On June 16, 1916, it was reported (112) that “St. Elmo Brady has gone east to spend the summer.” There are several curious points about this last item: first, that Brady was well-known enough that

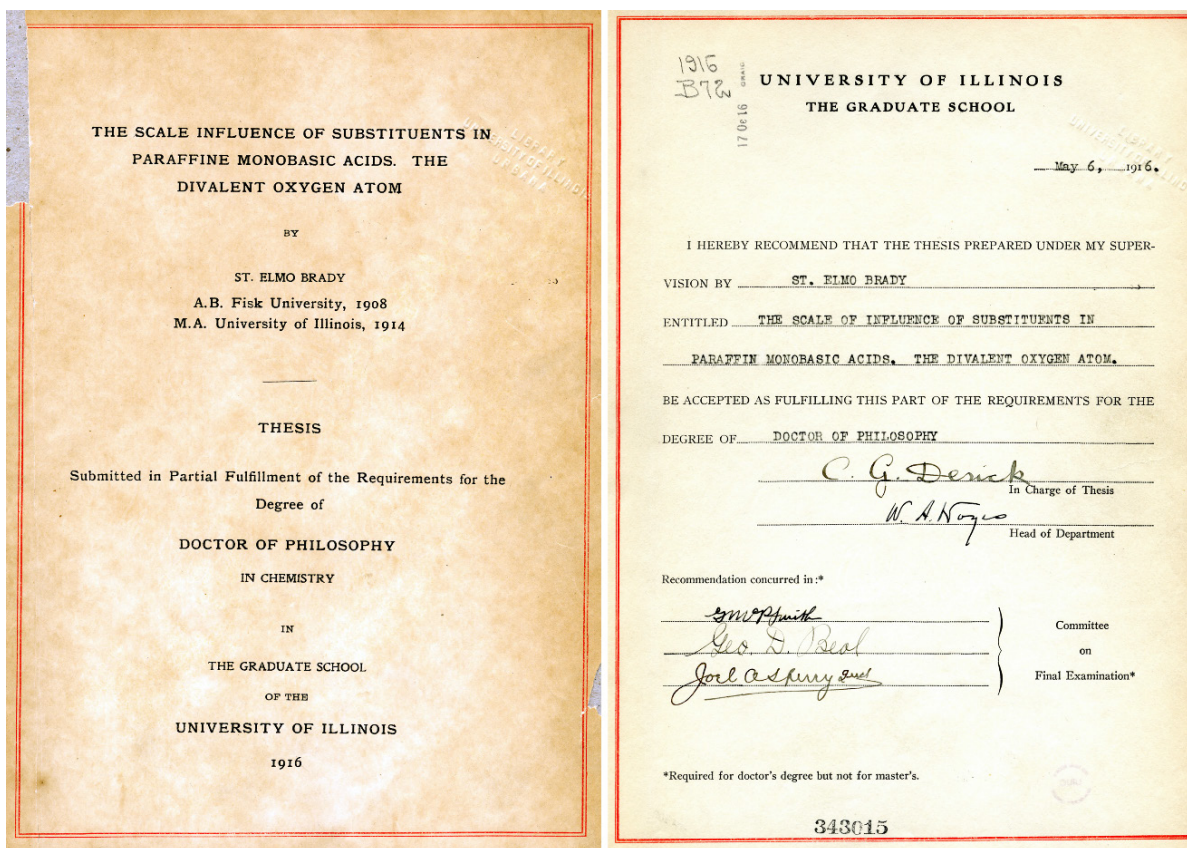


Figure 10. Cover and signature page of St. Elmo Brady's 1916 Ph.D. dissertation. Courtesy of University of Illinois University Archives.

his movements warranted a report in a local newspaper, and, second, that Brady was leaving the University to start the next phase in his life. Brady's accomplishment in earning his Ph.D. degree was also reported nationally (113) in an article published in August 1916 issue of *The Crisis*, the official magazine of the NAACP. This article stated: "He is at present head of the division of science at Tuskegee Institute." So, by August 1916 Brady had returned to the position he left in June 1913.

Brady's Ph.D. advisor, Derick, left the University of Illinois later in 1916 to join the National Aniline and Chemical Co. as director of the Schoellkopf Research Laboratory in Buffalo, New York. He left Illinois because the money was much better and he found the research interesting (114). Derick's replacement on the Illinois faculty was a rising star, Roger Adams (1889-1971), who was to become one of the greatest U.S. chemists of the 20th century (115). Although Edward Chandler had carried out most of his Ph.D. research under Derick (116), after Derick left the university Adams became Chandler's advisor of record and signed his thesis in Derick's place.

Tuskegee Normal and Industrial Institute: 1916-1920

Brady's decision to return to Tuskegee was not an easy one. Brady was aware of how inadequately the Tuskegee Institute laboratories were equipped to do research in chemistry at the level that he had enjoyed at Illinois. How aware he was is indicated by a candid statement (26), "here I was an ambitious young man, who had all of the advantage of a great university, contact with great minds, and the use of all modern equipment. Was I willing to forget these and go back to a school in the heart of Alabama where I wouldn't have even a Bunsen burner?" But Brady had attended Illinois while on a leave of absence from Tuskegee (64), and had always intended to go back. Brady must also have had a strong sense of loyalty to Tuskegee and strong ties of friendship to his former colleagues. Even though Booker T. Washington had died in 1915, he had clearly made a strong impression on Brady, instilling in him the urge to contribute to the education of African Americans.

Shortly after returning to Tuskegee, Brady met Myrtle Marie Travers (1894-1990) (Figure 11) (117).



Figure 11. Myrtle Marie Travers. Courtesy of Carol Brady Fonvielle.

Myrtle had graduated from East High School in Denver in 1914. East, which was considered the best high school in Denver at the time, was integrated. She attended



Figure 12. Myrtle Marie Travers and St. Elmo Brady. Courtesy of Carol Brady Fonvielle.

Kansas Normal School in Emporia, Kansas, which at the time was the largest normal (i.e., teacher training) school in the country. Kansas Normal School had been accredited in 1898 and in that same year graduated its first African-American students (118). Myrtle did one year of “normal work” in Denver and then went to teach at Tuskegee (64). She often told her granddaughter that most of the students were older than she was: “They would leave school to work the farm and come back when they had some money for tuition” (23).

Family lore has it that both St. Elmo and Myrtle were smitten when they first met. She would often cut photos of the two of them into the shape of a heart (Figure 12). On August 28, 1917, Myrtle’s mother invited friends and family to their home in Denver to meet Brady, and the guests were surprised when they discovered that they were attending a wedding. When the young couple returned to Tuskegee, they lived with Mrs. Booker T. Washington because there was a shortage of available housing in the town (23). St. Elmo and Myrtle socialized with the other faculty and staff at Tuskegee, as shown by a photo of a picnic gathering at the Tuskegee Institute (Figure 13).

During this period, Brady focused on developing the undergraduate chemistry program at Tuskegee. By December 1916 he had written and published a 66 page monograph, *Household Chemistry for Girls* (119). The intended audience was girls at the secondary level, and the book includes exercises at the end of each chapter and illustrations of simple apparatus (Figure 14). Brady notes in Chapter 1 (p 15):

Then too, many substances which are used in the home today are made in the chemical laboratory or on a commercial scale. But the occurrence, properties and preparation of the elements and compounds constitute only a part of the subject matter of chemistry. There are rules which tell how these substances act and we shall know and study them as the laws of chemistry.

Importance of chemistry.—For a correct knowledge of the other sciences such as botany, agriculture, biology, and zoology, it is necessary to have a knowledge of chemistry. It is one of the most practical sciences taught today, for all the facts and methods are intimately interwoven into our daily life. Its application in such fields as medicine, sanitation, manufacture, and domestic science has increased wonderfully man’s knowledge of nature’s workings and has abundantly added to the pleasures and comforts of life. There is hardly a phase of human life which chemistry does not touch. ...



Figure 13. Picnic on the grounds of Tuskegee Institute between 1916 and 1920. St. Elmo and Myrtle Brady are second and third from the right in the front row. Courtesy of Carol Brady Fonvielle.

It is possible that during these years Brady started collecting the material that became the Booker T. and Maggie Washington Collection (121), which today is housed at the Fisk University Archives. The materials include Booker T. Washington's invitation to the 1902 inauguration of Woodrow Wilson as president of Princeton, as well as examples of his correspondence with Andrew Carnegie, John D. Rockefeller, Theodore Roosevelt, and William Howard Taft.

The inferior chemistry facilities at Tuskegee, along with Brady's teaching and other duties as head of the Science Department, would have severely restricted his ability to conduct a research program, and he published no research papers during his time at Tuskegee. When the opportunity arose to move to a better chemistry program, Brady took it.

Howard University: 1920-1927

In 1920, at age 36, Brady accepted an offer from Howard University in Washington, DC, to become Professor and Head of the Department of Chemistry.

Howard University had been founded in 1867 by an Act of Congress, the only one of the HB-CUs to hold that distinction (122). A contemporary report noted (123):

In variety and quality of professional training and in number of college students Howard stands first among educational institutions for colored people. ... The university organization

includes nine divisions: (1) secondary, (2) arts and sciences, (3) teacher-training, (4) manual arts and engineering, (5) commercial, (6) music, (7) theology, (8) law, and (9) medicine, including dentistry and pharmacy.

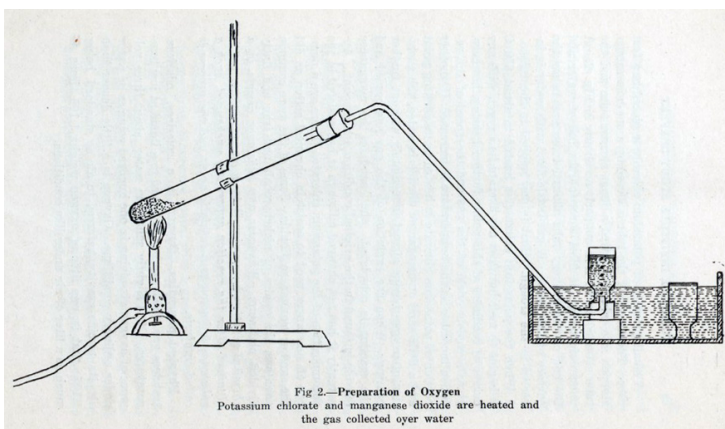


Figure 14. Figure 2 from *Household Chemistry for Girls* (120).
Courtesy of Carol Fonvielle Brady.

The first seven divisions shared the main buildings and were in close proximity to the administration. In practice, Howard University was open to all races, creeds, and sexes from its beginning. In 1914, the total enrollment was 1401, of whom 1082 were male and 319 female. Howard did not have an elementary school component, but 373 students were enrolled in the secondary school and 534 attended the arts and sciences, teacher-training, and engineering divisions of the College. There were 106 teachers and workers, of whom 33 were white and 73 were African American. The College of Arts and Sciences had 21 faculty and staff members.

A new science building, dedicated in 1910, was named Thirkield Hall after the Howard University president, Wilbur P. Thirkield (1854-1936), who secured the funding; Thirkield not only built a modern science building, he also secured funding for an expansion of the science faculty. The building had three floors, one each for physics, biology, and chemistry instruction, a 225-seat lecture hall and private laboratories in the basement (124). One can see the draw for Brady: access to modern facilities similar to those he had had access to at Illinois as well as access to some of the best African-American students in the country.

Furthermore, Howard University's first Committee on Graduate Studies was established in the 1918-1919 academic year, just before Brady's arrival. Before that date (125):

Doctoral work had never been offered at Howard, but masters' degrees had been awarded at the school from its inception. In the late 19th century a graduate could earn the Master of Arts (M.A.) or Master of Science (M.S.) degree simply by undertaking three years of "professional, literary, or scientific studies" outside of the university and then submitting a sketch of his occupation and the line of study in which he was most interested. ... Around 1900 a thesis was added as part of the requirements, and year by year after that the requirements were stepped up to include comprehensive examinations, a year in residence, specific scholarly aims, and the like. There was no real program, however, and few degrees were awarded; only a highly motivated graduate would stay to work under a favorite teacher who might or might not be willing to spend the extra time, in addition to a heavy undergraduate course load, directing advanced thesis work. Most of the M.A. degrees awarded were in history or education. The Master of Science was never awarded and in 1907 ... it was abolished because of lack of interest.

As soon as Brady arrived on campus he was appointed to the Committee on Graduate Studies, serving along with two other faculty members, the biologist Ernest E. Just (1883-1941) and the writer and philosopher Alain LeRoy Locke (1885-1954). These three men had doctorates from well-known institutions and were the pride of the Howard University community. They created a graduate program at the master's level requiring a research thesis, which was listed in the catalog for the 1920-21 academic year.

On June 8, 1923, Marcelle Bernice Brown was granted the first M.S. degree in chemistry from Howard for the thesis "The Action of Nitrosyl on the Unsaturated Hydrocarbons of Petroleum (126)." This was also the first research-based Master of Science degree in chemistry granted at Howard, and likely at any HBCU (127-131). Frank W. Williams was the second student at Howard University to earn a M.S. degree in chemistry, graduating on June 5, 1925, with thesis entitled "Preparation and Properties of 2,3-Dimethylpentanol-2" (132); he later became a professor of chemistry at Howard. Three more students, Eric Byron Chandler (thesis title "Preparation

Table 2. Publications of St. Elmo Brady, 1918-1954

1. C. G. Derick and S. E. Brady, "The Ionization Constants of Certain Ketoparaffine Monobasic Acids," *Science* **1915**, 42, 103.
2. S. E. Brady, "The Behavior of β -Phenoxy Ethyl Bromide in the Wurtz-Fittig Synthesis," *Science*, **1916**, 44, 288.
3. S. E. Brady and G. C. Derick, "Preparation and Characterization of ϵ -Acetylcaproic Acid," *Science*, **1916**, 44, 288.
4. G. D. Beal and S. E. Brady, "The Hydrochloride Method for the Determination of Alkaloids," *J. Ind. Eng. Chem.*, **1916**, 8, 48.
5. S. E. Brady, *Household Chemistry for Girls*, Tuskegee Normal and Industrial Institute, Tuskegee, AL, 1916
6. S. E. Brady, "Phytochemical Study. Seeds of the *Magnolia grandiflora*," *J. Am. Pharm. Soc.*, **1938**, 27, 404-417.
7. S. E. Brady, "*Ricinus cominunis*. I. Oxidation of Ricinoleic Acid," *J. Am. Chem. Soc.*, **1939**, 61, 3464-3467.
8. S. E. Brady and S. P. Massie, "1,1-Dichloroheptane," *Proc. Okla. Acad. Sci.*, **1952**, 33, 261-262.



Figure 15. St. Elmo Brady in Chase Hall, early 1930s. Image courtesy of Fisk University Archives (143, 144).

of 6-Quinoline Propionic Acid”), James Henry Green (thesis title “The Catalytic Effect of Sulphates Upon the Determination of Nitrogen by the Kjeldahl-Gunning Method”), and Roscoe Edwin Lewis (thesis title “Preparation of Alpha Quinolyl Propionic Acid”), earned M.S. degrees in Chemistry at Howard University on June 10, 1927 (133). It is likely that Brady mentored all of these students.

Brady built a strong undergraduate program in chemistry at Howard and planned for a new chemistry building (26) but did not stay to see it built: it was opened nine years after he left, on October 26, 1936 (134). Although Brady spent only seven years at Howard, he clearly had a major impact on its chemistry program. He also was involved with athletics on the campus: in 1925 he served as Secretary for the Howard Board of Athletic Control (135).

During Brady’s time at Howard, he and Myrtle had two sons, St. Elmo Brady Jr. (1922-1953) and Robert Travers Brady (1924-1928). Myrtle called Brady, Sr. “Chick” or Elmo; friends and family addressed St. Elmo Brady Jr. as “Saint,” although Myrtle called him Junior (23).

Myrtle enjoyed living in Washington, DC: she went back to school at Howard University and completed her B.A. degree. She was a member of Kappa Mu, the honor society that was the forerunner of Phi Beta Kappa, and the Alpha Kappa Alpha Sorority. After the children arrived, the Bradys hired a nanny and Myrtle “worked where she could use her skills” (23). They kept their house in Washington, DC, even after Brady moved back to Fisk University.

Fisk University: 1927-1952



Figure 16. Chemistry laboratory at Fisk University. Brady is not in this image. Courtesy of Carol Brady Fonvielle.

In 1927, Prof. Talley retired at Fisk University and the new president, Thomas Elisa Jones (1888-1973), asked Brady to return to his undergraduate university to take Talley’s place as professor and chair of the chemistry department (26, 136). Brady did so and remained at Fisk for the next 25 years, during which time he taught general and organic chemistry to hundreds of students (137). He revamped the chemistry undergraduate program

(138) and founded the second graduate program in chemistry at an HBCU (after starting the process of establishing the first one at Howard University).

Brady also led the effort to construct the first building at an HBCU dedicated entirely to chemistry (i.e., not a shared “science” space). In 1928-1929, he served as the president of the General Alumni Association of Fisk University and as chair of its executive committee. Together with his finance committee, he worked out a plan whereby the Alumni “could easily raise the \$10,000 budget” for the new chemistry building. Alumni in each state and city were called upon to raise a specified amount (139). The timeline for the new building was likely sped up after a fire destroyed Chase Hall (Figure 15), the previous chemistry building at Fisk (140), on November 15, 1929 (141). When the building was opened in Fall 1931 (134, 142), it was called the New Chemistry Building (Figure 16), but is now known as Talley-Brady Hall in honor of these two pioneers of chemical education.

During his time as head of the chemistry department, Brady assembled an outstanding faculty. He created the Thomas W. Talley Lectures in honor of his former mentor, which brought important chemists to the campus; typically, the invited speaker also served as the outside examiner for oral examinations of chemistry M.A. candidates. In 1937, the well-known organic chemist Henry Gilman (1893-1986) of the University of Iowa was the invitee; he was typical of the stature of those giving the Talley Lecture (128). Gilman’s presence at Fisk led several of Brady’s students, including Samuel P. Massie, to go to Iowa to work for Gilman. Other Talley lecturers included Roger Adams, Herbert Carter, and Ralph Shriner (all of Illinois), Louis Fieser of Harvard, Calvin VanderWerf of Kansas, Robert Levine of Pittsburgh, Herbert Brown of Purdue, and many more (137). Brady had played football when he was an undergraduate at Fisk, and he must have retained an interest in athletics: he served as chairman of the Fisk Board of Athletic Control as early as 1928 (140). In 1936 and 1937 he served as chairman of the Southern Intercollegiate Athletic Conference (145). Brady was also involved in several fraternal organizations, including Sigma Pi Phi, the oldest continuously-existing African-American fraternity (137, 146), and Alpha Phi Alpha, the first African-American fraternity to establish collegiate chapters (137, 147).

The research Brady carried out at Fisk resulted in several publications, including a 1938 paper in the *Journal of the American Pharmaceutical Society* on the phytochemicals in the seed of the magnolia (148), and a 1939 paper in the *Journal of the American Chemical Society* on the reactions of ricinoleic acid (149). Brady recognized, as did George Washington Carver, that finding better uses of agricultural products was important to

the economy of the South, so he studied two substances which were abundant but little used, magnolia seeds and ricinoleic acid (from castor oil) (137). Brady published one additional paper in 1952, with Samuel P. Massie, on the preparation of 1,1-dichloroheptane (150). Brady obtained money for one of the first infrared spectrophotometers at an HBCU. In conjunction with faculty from the University of Illinois, Brady established a summer program in infrared spectroscopy at Fisk, which was open to faculty members from all colleges and universities anywhere (26). Brady continued to be interested in the development of recipes for useful products that could be made and used in the home. Several of these formulations were found in his files and one is shown in Figure 17.

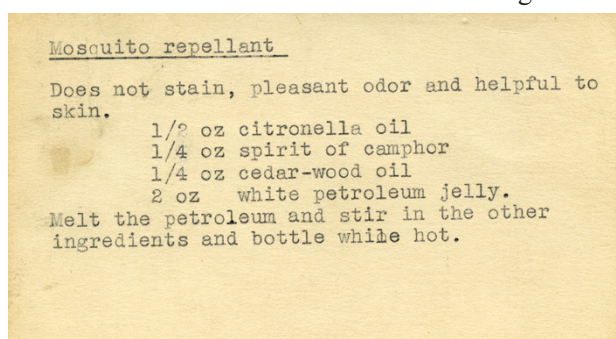


Figure 17. A chemical formulation or recipe from Brady’s files that would have been useful for daily home needs of low-income families. Courtesy of Carol Brady Fonvielle.

Brady’s publication list consists of three meeting abstracts, four full papers, and a textbook (Table 2). That he published at all is noteworthy: at Tuskegee he did not have access to a well-equipped laboratory,



Figure 18. Certificate of Recognition presented to St. Elmo Brady upon his retirement from Fisk University. Courtesy of Carol Brady Fonvielle.

and in his positions at Howard, Fisk, and Tougaloo he mentored undergraduate and master's students who often did not work under him long enough to carry a study to completion. In addition, he had a significant teaching and administrative load due to his position as chair of the chemistry department. We do not know, but it is possible that some manuscripts were submitted but not published owing to the prejudice of reviewers who did not believe that quality work could come from a "negro school" (151).

At the time of his retirement from Fisk University in 1952 (152), the Department of Chemistry organized a testimonial dinner honoring his achievements on May 30 of that year. Brady was presented with a certificate from the Nashville Local Section of the American Chemical Society (Figure 18), recognizing his many years of service.

The Department also reached out to his former students and solicited letters expressing the gratitude of the writer for Brady's efforts. These letters were assembled into a binder and presented to Brady along with the following note (153):

It was generally agreed among his colleagues that nothing would be more appropriate than a collection of genuine and sincere expressions of appreciation from those whose lives he touched in the classroom—his students. These are a teacher's rewards, for in their radiance the world sees the light of his greatness.

A common theme throughout these letters is that Brady always took the time to help. Several quotes from the letters follow.

I always did enjoy listening to you talk, whether it was about chemistry or life. I will always remember you as a person who has dedicated a major part of his life in helping prepare young people to take their places as good citizens in a changing world.

You became a foster parent to many of the sons and daughters of Fisk. ... three things will always be remembered by your students. The first quality is: Your great ability in making the student understand chemistry, so that it became a living subject, surrounding the student in his everyday life. The second quality is: Your devotion to the slow student, so that he would be able to realize as much from your lecture as the most brilliant student. The third quality is: An expression that has become synonymous with your name, wherever it is mentioned, "CHALK and TALK."

I will never forget and truly appreciate the many times you have made me feel at home, in the quiet of your office.

So often we associate our teacher with one certain room, building, or department. But with you this is

not so. You mean Fisk itself—here and everywhere that your tireless service and intense loyalty have helped make Fisk known.

You may have forgotten, but, through the smoky haze from your ever-present briar [see Figure 19], you spoke to me of having deliberately chosen teaching instead of industry, of preparing lectures instead of writing papers. ... A teacher's reward is often not pecuniary, but an aggregate of prestige, pride in one's pupils, esteem of pupils and colleagues, and that undeniable thrill when it is evident that a student understands.



Figure 19. St. Elmo Brady with his favorite pipe in the late 1950s or early 1960s. Courtesy of Carol Brady Fonvielle.

In 1952, Fisk was the first historic black college or university to be granted a Phi Beta Kappa chapter (154) and, in 1961, when Brady returned to Fisk to accept the Fisk Distinguished Alumni Award, he was inducted into that society (155). In 1960, the Fisk University Department of Chemistry announced the Brady Lecture Series, which had the goal of bringing outstanding industrial chemists to the campus. The inaugural lecturer on April 7, 1960, was Ernest H. Volwiler (1893-1992), the chairman of the Board of Abbott Laboratories. Appropriately, Volwiler received his M.A. and Ph.D. degrees at the University of Illinois in 1916 and 1918, respectively; he had been the first graduate student of legendary Illinois chemist Roger Adams (1889-1971) and he knew Brady personally. The Talley Lecture Series and the Brady

Lecture Series would eventually merge to become the Talley-Brady Lecture Series.

Myrtle did not like the Deep South, where there were limited employment opportunities for African-American women (156). When Brady moved in 1927 from Howard University in Washington, DC, to Fisk in Nashville, Tennessee, Myrtle elected to continue to live and work in DC, traveling to Nashville when she was needed as a hostess. Myrtle drove and Brady did not. She drove everywhere: she drove Brady Jr., to summer camp, “Atwater” in Massachusetts; she drove the family to Highland Beach on the coast of Maryland, which is where the summer home of Frederick Douglass is located. When Brady was in Washington, DC, he would often take the street car to the Library of Congress—that and trains were his principal modes of travel. Brady went to DC often and usually spent the summers there, working at the Library of Congress.

The Bradys lost their younger son, Robert, when he was 4 years old, on August 6, 1928 (157), as the result of a traffic accident (23). Brady spoke proudly of his elder son, St. Elmo Brady Jr., who attended Fisk University and then went to Howard University for his M.D. degree. He married Romayne Elizabeth Mitchell (1925-2003) and they had a daughter, Carol, in 1945. The couple divorced, and Brady Jr. later married Felicia Loretta Crawford (1928-1994) (158); together they had a daughter Beryl Alice (1951-1995) (159). Brady Jr. was practicing medicine in Cambridge, Massachusetts, when he died as a result of a gas explosion in his home in 1953 (160, 161).

Tougaloo College: 1952-1966

Dr. Brady retired from Fisk University in 1952 (162) and returned to Washington, DC (Figure 20). After the death of his son, however, he looked for something to take his mind off of his own troubles (23). Brady was asked to assist the development of the chemistry department at Tougaloo College, in Jackson, Mississippi.

Tougaloo College had started when the American Missionary Association of New York purchased 500 acres of a former plantation in central Mississippi. Their purpose was to create a college for education of freedmen and their children. It started with a teaching facility and a small dormitory for female students. It was not a university, despite the name, but its students received sufficient education to qualify them for employment as teachers. In 1871, the Mississippi State Legislature granted the

school a formal charter under the name of Tougaloo University. At the end of 1871, legislation authorized the establishment of Tougaloo as a normal school, but State support was withdrawn in 1892 (163, 164). In the 1960s the campus served as a safe harbor for those involved in the fight for civil rights in the United States: Tougaloo College opened its campus to the Freedom Riders and other civil rights workers. At present, the school has about 900 students (165).



Figure 20. St. Elmo Brady and his dog, early 1950s. Courtesy of Carol Brady Fonvielle.

While at Tougaloo, Brady carried out chemical studies of *Ligustrum*, more commonly known as privet hedge. His aim was to isolate from its berries a chemical that could be used to treat cancer and/or malaria. He also helped design and build a new science building at Tougaloo and recruit new faculty members. In appreciation for his efforts, Dr. Brady was memorialized with a bronze plaque on the second floor of the building at Tougaloo that houses the chemistry laboratories, Kincheloe Hall. The plaque states that henceforth the laboratory is to be known as the St. Elmo Brady Chemistry Laboratory (165).

Finis: 1966

St. Elmo Brady died in Washington, DC, on Christmas Day 1966 at age 82, and was interred at Lincoln Memorial Cemetery in Suitland, Maryland (28). He had led a full life as a professional pioneer, role model, dedicated leader, and teacher. He had a notable influence on the development of many students and faculty colleagues. His former students remembered him with the following words (28):

Brady not only built buildings and departments, he built men and women. He was never too busy to listen to the problems of a student or fellow faculty member... Although he is gone as a person, his

shadow remains. It will always remain when men turn down offers for personal gain to serve others. It will always be there as a friendly teacher helps a student or a young colleague. It will show wherever better facilities in chemistry are erected... Truly the story of chemistry at four institutions is the lengthened shadow of a great teacher, friend and scholar—St. Elmo Brady.

In 2002, Brady was highlighted in the designation of the William Albert Noyes Laboratory on the University of Illinois campus as a National Historic Chemical Landmark (NHCL) by the American Chemical Society (166). The Landmark celebrated the thousands of students and the hundreds of faculty members who had learned and worked in Noyes Laboratory in the 100 years since its opening in 1902. St. Elmo Brady was included in the list of distinguished alumni.

In 2019, St. Elmo Brady was honored with a National Historic Chemical Landmark designation of his own (167-169). The Landmark noted that, aside from being the first African American to earn a Ph.D. degree in chemistry

Brady went on to build chemistry curricula, faculty, programs and facilities at four major historically black colleges and universities (HBCUs), where he and his colleagues mentored multiple generations of African-American chemists. His life was truly an inspiration to all who had the privilege to meet him, and his legacy lives on.

Supplemental Material

The following can be found in the Supplemental Material for the Bulletin for the History of Chemistry at the journal's website, <http://acshist.scs.illinois.edu/bulletin/index.php>:

1. Chemical Genealogy for St. Elmo Brady
2. Biographical Information—Chemical Genealogy for St. Elmo Brady
3. Noyes Laboratory at the University of Illinois, National Historic Chemical Landmark, American Chemical Society, <https://www.acs.org/content/acs/en/education/whatischemistry/landmarks/noyeslaboratory.html> (accessed Dec. 1, 2020).
4. St. Elmo Brady A National Historic Chemical Landmark, <https://www.acs.org/content/acs/en/education/whatischemistry/landmarks/st-elmo-brady.html> (accessed Dec. 1, 2020).
5. An image showing Champaign and Urbana in 1913, cropped from the map found at <https://digital.library.illinois.edu/items/459bd720-c576-0134-2373->

0050569601ca-c. Black lines outline the “North End” and a red dot indicates the house Brady had a room in in 1916.

Acknowledgements

One of us (VVM) worked closely with Mrs. Carol Brady Fonvielle, St. Elmo Brady's granddaughter, in preparing the St. Elmo Brady National Historical Chemical Landmark designation at Illinois and the four HBCUs involved. Our deepest thanks are extended to Mrs. Fonvielle, who shared the many artifacts associated with her grandfather during this process, culminating in an exhibit at the University of Illinois Archives in February/March 2019. Her generosity has immeasurably increased our knowledge of St. Elmo Brady and his family.

References and Notes

1. D. F. Martin and B. B. Martin “St. Elmo Brady (1884-1966): Pioneering Black Academic Chemist,” *Florida Scientist*, **2006**, 69(2), 116-123.
2. H. W. Greene, *Holders of Doctorates among American Negroes: An Educational and Social Study of Negroes Who Have Earned Doctoral Degrees in Course, 1876-1943*, Crofton Publ. Corp., Newton, MA, 1974, pp 140, 145.
3. Edward Bouchet was the first African American to earn a doctorate in any subject. See Refs. 2 and 4.
4. “This Month in Physics History—June 1876: Edward Bouchet Becomes the First African American Ph.D. in Physics,” *APS News*, **2007**, 16(6), 2.
5. “Nurturing Black Chemists,” *Chem. Eng. News*, **2020**, 98(34), 27.
6. A. A. Widener, “A Bright Spot in Training Black Chemists,” *Chem. Eng. News*, **2020**, 98(34), 28-33.
7. C. H. Arnaud, “Weeding Out Inequity in Undergraduate Chemistry Classes,” *Chem. Eng. News*, **2020**, 98(34), 34-37.
8. A. A. Widener, “The Leaky Pipeline for Black Chemists,” *Chem. Eng. News*, **2020**, 98(22), 14.
9. L. L. Espinosa, K. McGuire and L. M. Jackson, Eds., *National Academies of Sciences, Engineering, and Medicine 2019. Minority Serving Institutions: America's Underutilized Resource for Strengthening the STEM Workforce*, National Academies Press, Washington, DC, p 14, <https://doi.org/10.17226/25257>
10. S. N. Collins, “African Americans and Science,” *Chem. Eng. News*, **2009**, 87(43), 3.
11. Year: 1850; Census Place: Louisville Ward 8, Jefferson, Kentucky; Roll: 207; Page: 398a; Ancestry.com. 1850

- United States Federal Census [database on-line]. Provo, UT, USA: Ancestry.com Operations, Inc., 2009. Images reproduced by FamilySearch. Original data: Seventh Census of the United States, 1850; (National Archives Microfilm Publication M432, 1009 rolls); Records of the Bureau of the Census, Record Group 29; National Archives, Washington, DC (accessed Dec. 1, 2020).
12. Kentucky, U.S., County Marriage Records, 1842-1853. Ancestry.com. Kentucky, U.S., County Marriage Records, 1783-1965 [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc., 2016. Original data: Marriage Records. Kentucky Marriages. Madison County Courthouse, Richmond, Kentucky (accessed Dec. 2, 2020).
 13. An image of Mary Jane Bland can be found at Ancestry.com: <https://www.ancestry.com/family-tree/person/tree/4116549/person/-1649807833/facts> (accessed Feb. 28, 2021).
 14. Year: 1860; Census Place: Louisville Ward 8, Jefferson, Kentucky; Page: 759; Family History Library Film: 803376. Ancestry.com. 1860 United States Federal Census [database on-line]. Provo, UT, USA: Ancestry.com Operations, Inc., 2009. Images reproduced by FamilySearch. Original data: 1860 U.S. census, population schedule. NARA microfilm publication M653, 1,438 rolls. Washington, DC: National Archives and Records Administration, n.d. (accessed Dec. 1, 2020).
 15. K. Parker, J. M. Horowitz, R. Morin and M. H. Lopez, "Race and Multiracial Americans in the U.S. Census," in *Multiracial in America*, Pew Research Center Report, 2015, <https://www.pewsocialtrends.org/2015/06/11/chapter-1-race-and-multiracial-americans-in-the-u-s-census/> (accessed Dec. 2, 2020).
 16. Year: 1850; Census Place: Louisville Ward 8, Jefferson, Kentucky; Roll: 207; Page: 427b; Ancestry.com. 1850 United States Federal Census [database on-line]. Provo, UT, USA: Ancestry.com Operations, Inc., 2009. Images reproduced by FamilySearch. Original data: Seventh Census of the United States, 1850; (National Archives Microfilm Publication M432, 1009 rolls); Records of the Bureau of the Census, Record Group 29; National Archives, Washington, DC.
 17. We will use Celester Parker as an example. In the 1880 US Census (see Ref. 21), Celester's age was given as 21; calculated birth year 1859. In the 1900 US Census (see Ref. 22), Celester's age is given as 34; calculated birth year 1866. We tend to think that the earliest census information is likely to be the most accurate. Discrepancies in ages and birth years claimed from census to census is common for many of the early members of the Brady family tree, and likely many living at that time.
 18. Kentucky, US, Death Records 1852-1965. Film 7007126: Louisville, Books 1-4. Ancestry.com. Kentucky, U.S., Death Records, 1852-1965 [database on-line]. Lehi, UT, USA: Ancestry.com Operations Inc, 2007. Original data: Kentucky. Kentucky Birth, Marriage and Death Records—Microfilm (1852-1910). Microfilm rolls #994027-994058. Kentucky Department for Libraries and Archives, Frankfort, Kentucky. Birth and Death Records: Covington, Lexington, Louisville, and Newport—Microfilm (before 1911). Microfilm rolls #7007125-7007131, 7011804-7011813, 7012974-7013570, 7015456-7015462. Kentucky Department for Libraries and Archives, Frankfort, Kentucky. Kentucky Vital Statistics Original Death Certificates—Microfilm (1911-1964). Microfilm rolls #7016130-7041803. Kentucky Department for Libraries and Archives, Frankfort, Kentucky. (accessed Dec. 2, 2020).
 19. California, US, Death Index, 1905-1939, Surname Range: A-E. Ancestry.com. California, U.S., Death Index, 1905-1939 [database on-line]. Provo, UT, USA: Ancestry.com Operations, Inc., 2013. Original data: California Department of Health and Welfare. California Vital Records-Vitalsearch (www.vitalsearch-worldwide.com). The Vitalsearch Company Worldwide, Inc., Pleasanton, California. (accessed Dec. 2, 2020).
 20. Kentucky, U.S., County Marriage Records, 1783-1965. Year Range: 1884-1885. Death Ancestry.com. Kentucky, U.S., County Marriage Records, 1783-1965 [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc., 2016. Original data: Marriage Records. Kentucky Marriages. Madison County Courthouse, Richmond, Kentucky. (accessed Dec. 2, 2020).
 21. Year: 1880; Census Place: Louisville, Jefferson, Kentucky; Roll: 424; Page: 178C; Enumeration District: 141; Ancestry.com and The Church of Jesus Christ of Latter-day Saints. 1880 United States Federal Census [database on-line]. Lehi, UT, USA: Ancestry.com Operations Inc, 2010. 1880 U.S. Census Index provided by The Church of Jesus Christ of Latter-day Saints. Original data: Tenth Census of the United States, 1880. (NARA microfilm publication T9, 1,454 rolls). Records of the Bureau of the Census, Record Group 29. National Archives, Washington, DC.
 22. Year: 1900; Census Place: Louisville Ward 11, Jefferson, Kentucky; Page: 10; Enumeration District: 0114; FHL microfilm: 1240532; Ancestry.com. 1900 United States Federal Census [database on-line]. Provo, UT, USA: Ancestry.com Operations Inc, 2004. Original data: United States of America, Bureau of the Census. Twelfth Census of the United States, 1900. Washington, DC: National Archives and Records Administration, 1900. T623, 1854 rolls.
 23. Personal communication, Carol Brady Fonvielle, 2019.
 24. E. E. Calkins, "St. Elmo or, Named for a Best Seller," *Sat. Rev. Lit.*, **1939**, 21(8), 3-4, 14, 16-17.
 25. Fedora was born in June 1890 and died on June 1, 1907, both in Louisville. Buszeder was born in Louisville on October 19, 1892. She graduated from Atlanta Univer-

- sity with an A.B. degree in 1914, and by 1919 she was a teacher at Central Colored High School in Louisville, KY. In 1931 she was a teacher in Cincinnati, OH; in 1933 she was an instructor in English and acting principal at the high school associated with Kentucky State Industrial College in Frankfort, KY; and in 1936 she was a teacher at Frederick Douglass High School in Oklahoma City. In 1920, she married Pindar Mahon Flack (1878-1930), chair of surgery at the Louisville National Medical College; in the early 1930s she remarried to George Rufus Ragland (1896-1957), a prominent businessman in the insurance industry in Oklahoma City. Buszeder died in Oklahoma City on March 16, 1966. The origin of the name Buszeder is not known.
26. S. P. Massie, "St Elmo Brady: The Lengthened Shadow," *Chemistry*, **1970**, 43(10), 7.
 27. T. C. Tilford-Weathers, *A History of Louisville Central High School 1882-1982*, General Printing Company, Louisville, KY, 1982, p 74.
 28. S. P. Massie, "The Lengthened Shadows," *Capital Chemist*, **1967**, 17(6), 139, 141.
 29. M. Jacobs, *St. Elmo Brady*, National Historic Chemical Landmark, American Chemical Society, Washington, DC, 2019.
 30. "Graduates of Schools," *Courier-Journal* (Louisville, KY), June 5, 1903, p 4.
 31. "The High School Commencement," *American Baptist* (Louisville, KY), June 26, 1903, p 2.
 32. T. J. Jones, *Negro Education, a Study of the Private and Higher Schools for Colored People in the United States*, Government printing Office, Washington, 1917, pp 259-281.
 33. G. C. Wright, *A History of Blacks in Kentucky: In Pursuit of Equality, 1890-1980*. University Press of Kentucky, 1992, pp 103-151.
 34. *Digest of Education Statistics, 2015 Tables and Figures*, Table 104.10: Rates of high school completion and bachelor's degrees attainment among persons age 25 and over, by race/ethnicity and sex: Selected years, 1910 through 2015. https://nces.ed.gov/programs/digest/d15/tables/dt15_104.10.asp (accessed Dec. 4, 2020).
 35. *U.S. Department of Commerce, Bureau of the Census, Current Population Reports, Series P-20, Historical Statistics of the United States, Colonial Times to 1970, Part 1*, US Department of Commerce, Bureau of the Census, Washington, DC, 1977, p. 76.
 36. Ref. 32, p 17.
 37. R. L. Mitchell Jr., *Thy Loyal Children Make Their Way: Fisk University Since 1866*, Fisk University Press, Nashville, TN, 1995.
 38. J. M. Richardson, *A History of Fisk University 1865-1946*, University of Alabama Press, Tuscaloosa, 1980, p 117.
 39. R. L. Mitchell, Jr. "Fisk University," *Tennessee Encyclopedia*, <http://tennesseencyclopedia.net/entries/fisk-university/> (accessed Dec. 5, 2020).
 40. Fisk University, Fisk University History, <https://www.fisk.edu/about/history/> (accessed Dec. 5, 2020).
 41. NAACP, NAACP History: W. E. B. Du Bois, <https://www.naacp.org/naACP-history-w-e-b-dubois/> (accessed Dec. 5, 2020).
 42. Ref. 32, pp 536-538.
 43. W. M. Brewer, "Thomas Washington Talley," *J. Negro History*, **1953**, 38(2), 251-253.
 44. L. P. Cockrell, "Thomas Washington Talley," *Tennessee Encyclopedia*, <https://tennesseencyclopedia.net/entries/thomas-washington-talley/> (accessed Dec. 5, 2020).
 45. "The Merchant of Venice," *Nashville Globe*, March 1, 1907, p 2.
 46. "City Items," *Nashville Globe*, Aug. 9, 1912, p 8.
 47. "Great Concert in Louisville—Under the Leadership of G. M. McClellan—Fisk's Famous Glee Participated," *Nashville Globe*, May 17, 1907, p 1.
 48. "St. Elmo Brady Retires from Fisk University," *Nashville Banner*, June 2, 1952, p 2.
 49. "Fisk University Commencement," *Nashville Banner*, June 17, 1908, p 4.
 50. "Normal school," *Merriam-Webster.com Dictionary*, Merriam-Webster, <https://www.merriam-webster.com/dictionary/normal%20school> (accessed Dec. 10, 2020). The definition given is "a usually 2-year school for training chiefly elementary teachers."
 51. B. T. Washington, *Up From Slavery*, Bantam, 1901, p 119. Washington describes the school's founding and early years in his autobiographical writings. <https://docsouth.unc.edu/fpn/washington/washing.html> (accessed Dec. 5, 2020).
 52. Tuskegee University, TU Presidents—Legacy of Leadership, <https://www.tuskegee.edu/discover-tu/tu-presidents> (accessed Dec. 5, 2020).
 53. A. W. Jones, "The Role of Tuskegee Institute in the Education of Black Farmers," *J. Negro History*, **1975**, 60(2), 252- 267.
 54. J. Ginsberg, *George Washington Carver: Chemist, Teacher, Symbol*, National Historic Chemical Landmark, American Chemical Society, Washington, DC, 2005.
 55. Ref. 32, p 19.
 56. Tuskegee University, History of Tuskegee University, <https://www.tuskegee.edu/about-us/history-and-mission> (accessed Dec. 5, 2020).
 57. Ref. 32, p 62.
 58. "Annual Catalogue Edition 1909-1910," *The Tuskegee Institute Bulletin*, **1909-1910**, 4(2), 6.

59. A. Ludwick, "Fly on the Wall: George Washington Carver and St. Elmo Brady," *Newsletter for Senior Chemists (ACS)*, March 2020, 3.
60. "Annual Catalogue Edition 1913-1914," *The Tuskegee Institute Bulletin*, 1913-1914, 8(2), 6. The other members of the Science Division were J. T. Williamson, John E. Anderson, and Inez Dickerson.
61. Personal communication, D. Chandler, 2020.
62. Ref. 58, p. 37.
63. Ref. 60, p 34.
64. "Tuskegee Institute Teacher Weds Tuskegee Professor," *Denver Star*, Sept. 1, 1917, p 8.
65. "George Washington Carver," Encyclopaedia Britannica, <https://www.britannica.com/biography/George-Washington-Carver> (accessed Dec. 6, 2020).
66. Personal communication, Raynard Kington, October 11, 2018.
67. J. M. Jay, *Negroes in Science: Natural Science Doctorates, 1876-1969*, Balamp Publishing, Detroit, MI, 1971 pp 45-46.
68. Act of July 2, 1862 (Morrill Act), Public Law 37-108, which established land grant colleges, 07/02/1862; Enrolled Acts and Resolutions of Congress, 1789-1996; Record Group 11; General Records of the United States Government; National Archives. <https://www.ourdocuments.gov/doc.php?doc=33> (accessed Dec. 6, 2020).
69. E. J. James, *The Origin of the Land Grant Act of 1862 (the so-Called Morrill Act) and Some Account of Its Author; Jonathan B. Turner*, University Press, Urbana-Champaign, 1910.
70. The 150th Anniversary of the Morrill Act was celebrated in 2012 via symposia at both the San Diego and Philadelphia National meetings of the American Chemical Society. Many of the speakers at those symposia contributed articles to the *Bulletin for the History of Chemistry*, 2013, 38(2). The articles in this issue to the anniversary of the Morrill Act are available via Open Access.
71. University of Illinois Act (110 ILCS 305. <https://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1086&ChapterID=18> (accessed Dec. 6, 2020).
72. R. A. Hatch, "The Illinois Legislations," *Some Founding Papers of the University of Illinois*, Univ. of Illinois Press, Urbana-Champaign, 1967, pp 59-71.
73. J. Rea (Recording Secretary of the Board of Trustees), *1st Annual Report of the Board of Trustees of the Illinois Industrial University*, Baker, Bailhache & Co., Springfield, IL, 1868. Proceedings of March 11, 1868, p 115.
74. S. W. Parr, "Historical Sketch of the Chemistry Department," Circular of Information of the Department of Chemistry, *Bulletin of the University of Illinois*, 1916, 13(25), pp 16-29.
75. W. L. Pillsbury (Secretary of the Board of Trustees), *22nd Report of the Board of Trustees of the University of Illinois*, Phillips Bros, Springfield, IL, 1904. Proceedings of June 8, 1903, p 77. That same page notes that one other person, Henry Livingston Coar, also received a doctorate (in mathematics) in 1903. This information does not allow us to determine who stood for the first Ph.D. examination at the University of Illinois.
76. [V. Bartow], *Centennial 1967*, Department of Chemistry and Chemical Engineering, Urbana, IL, 1967.
77. D. L. Cobb, *Race and Higher Education at the University of Illinois, 1945 to 1955*, Ph.D. Thesis, University of Illinois at Urbana-Champaign, 1998, pp 26-28.
78. D. L. Cobb, *Jim Crow Room & Board: The Experiences of African American Students at UIUC 1945 to 1955*, MA Thesis, University of Illinois at Urbana-Champaign, 1997. In eBlack Champaign-Urbana, Item #1115, <http://eblackcu.net/portal/items/show/1115> (accessed Dec. 7, 2020).
79. T. L. Hoff, *The History of African American Women at the University of Illinois, 1901-1939*, Ph.D. Thesis, University of Illinois at Urbana-Champaign, 2015, pp 65-66.
80. *Champaign-Urbana Outline Street Map, 1913*, Courtesy University of Illinois Archives. <https://digital.library.illinois.edu/items/459bd720-c576-0134-2373-0050569601ca-c>. A cropped image showing the "North End" and the location of Brady's 1916 housing is given in the Supplemental Information. (accessed Feb. 14, 2021).
81. Circular of Information of the Department of Chemistry, *Bulletin of the University of Illinois*, 1916, 13(25), p 71.
82. "Fraternities and Organizations," *Alumni Quarterly of the University of Illinois*, 1907, 1(1), 180.
83. W. Solberg, "The Catholic Presence at the University of Illinois," *Catholic Historical Review*, 1990, 76, 765-812.
84. Year: 1910; Census Place: Urbana Ward 2, Champaign, Illinois; Roll: T624_234; Page: 11B; Enumeration District: 0039; FHL microfilm: 1374247; Ancestry.com. 1910 United States Federal Census [database on-line]. Lehi, UT, USA: Ancestry.com Operations Inc., 2006. Original data: Thirteenth Census of the United States, 1910 (NARA microfilm publication T624, 1,178 rolls). Records of the Bureau of the Census, Record Group 29. National Archives, Washington, DC. (accessed Dec. 6, 2020).
85. C. M. Samson (Publ.), *Samson's Champaign and Urbana, Illinois City Directory 1912*, Pantagraph Printing and Stationary Co., Bloomington, IL, 1912, p 143 (William Brewer and family entry residing at 1202 W. Main).

86. C. M. Samson (Publ.), *Samson's Champaign and Urbana, Illinois City Directory 1914*, Pantagraph Printing and Stationary Co., Bloomington, IL, 1914, p 142.
87. C. M. Samson (Publ.), *Samson's Champaign and Urbana, Illinois City Directory 1916*, Pantagraph Printing and Stationary Co., Bloomington, IL, 1916, p 145 (St. Elmo Brady entry), p 147 (William Brewer entry).
88. Clark-Elwell Co. (Publ.), *Clark-Elwell Co. City Directory of Champaign-Urbana, IL 1918*, Flanigan-Pearson Co., Champaign, IL 1918, p 136 (Brewer, Wm chef at Beardsley hotel).
89. "Bethel African Methodist Episcopal Church," *Champaign County News*, Jan. 20, 1915, p 2.
90. "Reception for Pastor," *Champaign Daily Gazette*, June 10, 1916, p 1.
91. "Negroes Honor Dead Leader; Program Given at Salem Baptist for Booker T. Washington," *Champaign Daily News*, Nov. 19, 1915, p 9.
92. Y. S. Lamb, "Prof Samuel Massie Dies; Broke Naval Academy's Race Barrier," *Washington Post*, April 15, 2005, p B06.
93. S. E. Brady, *The Scale Influence of Substituents in Paraffine Monobasic Acids: The Divalent Oxygen Atom*, University of Illinois at Urbana-Champaign, Ph.D. Thesis, 1916, p 13.
94. S. E. Brady, *The Scale of Substitution in Organic Electrolytes: Oxygen Influence in Normal Monobasic Paraffin Acids*, University of Illinois at Urbana-Champaign, MA Thesis, 1914. <https://babel.hathitrust.org/cgi/pt?id=uiuo.ark:/13960/t72v4xk1r&view=1up&seq=6> (accessed Dec. 7, 2020).
95. L. F. Fieser, "Arthur Michael," *Biographical Memoirs Nat. Acad. Sci.*, **1975**, *46*, 330-367. Arthur Michael was a noted professor of chemistry at Harvard, who is the namesake of the Michael addition reaction. He taught no classes and was devoted to chemistry and art. In the *Biographical Memoirs*, Professor Louis Fieser wrote he was "a powerful theorist, a keen critic and a consummate experimentalist."
96. C. G. Derick, "Application of Polarity Measured in Terms of a Logarithmic Function of the Ionization Constant. II. Scale of Combined Influence of Substitution in Organic Compounds," *J. Am. Chem. Soc.*, **1911**, *33*, 1167-1181.
97. C. G. Derick, "Application of Polarity Measured in Terms of a Logarithmic Function of the Ionization Constant. III. Correlation of Chemical Structure with Ionization," *J. Am. Chem. Soc.*, **1911**, *33*, 1181-1189.
98. H. E. Cunningham (Secretary of the Board of Trustees), *27th Report of the Board of Trustees of the University of Illinois*, Illinois State Journal Co., Springfield, IL, 1914. Proceedings of Apr. 22, 1914, p 751.
99. H. E. Cunningham (Secretary of the Board of Trustees), *28th Report of the Board of Trustees of the University of Illinois*, Illinois State Journal Co., Springfield, IL, 1916. Proceedings of Apr. 27, 1915, p 248.
100. A. Michael, "Application of the "Scale of Combined Influence" to Explain the Ionization Constants of Organic Acids and a Reply to the Criticism of C. G. Derick," *J. Am. Chem. Soc.*, **1912**, *34*, 849-855.
101. Ref. 99, Proceedings of Aug. 4, 1915, pp 794-795.
102. C. G. Derick and S. E. Brady, "The Ionization Constants of Certain Ketoparaffine Monobasic Acids," *Science* **1915**, *42*, 103.
103. S. E. Brady and G. C. Derick, "Preparation and Characterization of ϵ -Acetylcaproic Acid," *Science*, **1916**, *44*, 288.
104. S. E. Brady, "The Behavior of β -Phenoxy Ethyl Bromide in the Wurtz-Fittig Synthesis," *Science*, **1916**, *44*, 288.
105. G. D. Beal and S. E. Brady, "The Hydrochloric Method for the Determination of Alkaloids," *J. Ind. Eng. Chem.*, **1916**, *8*, 48.
106. S. E. Brady, *The Scale Influence of Substituents in Paraffine Monobasic Acids: The Divalent Oxygen Atom*, University of Illinois at Urbana-Champaign, Ph.D. Thesis, 1916. <https://babel.hathitrust.org/cgi/pt?id=uiuo.ark:/13960/t2k66tw30&view=1up&seq=1> (accessed Dec. 7, 2020).
107. Ref. 106, p 170.
108. R. W. Hess, *The Scale Influence of Substituents in Paraffine Monobasic Acids: The Divalent Oxygen Atom*, University of Illinois at Urbana-Champaign, Ph.D. Thesis, 1916. <https://catalog.hathitrust.org/Record/100180488> (accessed Dec. 19, 2020).
109. C. G. Derick and R. W. Hess, "Scale of Influence of Substituents in Paraffin Monobasic Acids and the Correlation of Ionization with Structure. III. The Divalent Oxygen Atom in the ϵ -Position," *J. Am. Chem. Soc.*, **1918**, *40*, 537-558.
110. Raymond Washington Hess (1889-1956), <https://www.findagrave.com/memorial/115075308/raymond-washington-hess> (accessed Dec. 20, 2020).
111. Science History Institute, Edward Chandler, <https://www.sciencehistory.org/historical-profile/edward-chandler> (accessed Dec. 9, 2020).
112. "Local Notices—Urbana," *The Champaign Daily Gazette*, June 16, 1916, p 5 [St. Elmo Brady has gone east to spend the summer.]
113. "Men of the Month: A Chemist," *The Crisis*, **1916**, *12(4)*, 190-191.
114. C. G. Derick, "Autobiography," Clarence G. Derick Papers, 1965-67, University of Illinois at Urbana-Champaign, University Archives, Record Series No. 15/5/30.

115. D. S. Tarbell, *Roger Adams Scientist and Statesman*, American Chemical Society, Washington, DC, 1981.
116. E. M. A. Chandler, *The Molecular Rearrangement of Carbon Compounds*, University of Illinois at Urbana-Champaign, Ph.D. Thesis, 1917, p i (Acknowledgement), <https://babel.hathitrust.org/cgi/pt?id=uiuo.ark:/13960/t3xs82b46&view=image&seq=3> (accessed Dec. 19, 2020).
117. A short summary of Myrtle Travers's family history via personal communication with Carol Brady Fonvielle, 2019: "Myrtle was one of three children born to Alice Lenore Smith (1873-1919) and John Wellington Travers (1868-1926). Her siblings were her sister Harriet Ruth (1899-2001) and brother John Leslie (1904-1907). Alice was the daughter of David Smith (~1833-1926), who was born enslaved in Missouri (his owner was his father, a member of the Van Winkle family) and Hattie (Harriet) Thompkins (~1841-1920), also born enslaved in Missouri (her owner was the Thompkins family; as many slaves did, she took her slave owner's family name as her own). David received permission to purchase Harriet, they "married" and Harriet went to live with him on his father's farm. At some point, Harriet and David ran away from the farm with David's brother and went to Kansas. Family lore said David didn't want anything from a white man except his freedom and returned to the farm the horse they used to run away with. Family lore also has it that David didn't want his enslavers name (van Winkle) and so changed it to Smith. David fought in the Civil War on the Union side. The 1870 US Census locates the family in Grasshopper Falls (now Valley Falls), Kansas. David is listed as a white-farmer and Harriet as his mulatto wife, although the racial classifications seemed to change from census to census. Later David took up with a "fancy woman" named Ollie Fitzpatrick, who was quite a bit younger than David. David came to own several properties in Valley Falls, and lived at one address with Ollie and one daughter (the daughter would change from time to time) while Hattie lived in the same block with the remaining children. Harriet finally traveled to Denver, Colorado, taking Alice and the other children with her. Later David moved to California where he died in 1926. Harriet is more of a mystery—somehow her life ends in in St. Louis County, Missouri in 1920."
118. Emporia State University, History of Emporia State University, <https://www.emporia.edu/about-emporia-state-university/history-traditions/> (accessed Dec. 10, 2020).
119. S. E. Brady, *Household Chemistry for Girls*, Tuskegee Normal and Industrial Institute, Tuskegee, AL, 1916.
120. Ref. 119, p 21.
121. "St. Elmo Brady on Booker T. and Maggie Washington," <https://www.fisk.edu/wp-content/uploads/2020/06/brady-st.elmocollectiononbookert.andmaggiewashington.pdf> (accessed Dec. 10, 2020).
122. "Howard University," *The New Encyclopædia Britannica*, vol. 6 Micropædia, 15th ed., Encyclopædia Britannica, Inc, Chicago, IL, p 90.
123. Ref. 32, pp 149-154,
124. M. R. Feldman, "Chemistry at Howard University: The First Sixty Years (1867-1927)," HIST-0011 Abstract of papers. 220th American Chemical Society Meeting. 2000, Washington, DC.
125. K. R. Manning, *Black Apollo of Science: The Life of Ernest Everett Just*, Oxford University Press, New York, NY, 1983, p 209-210.
126. *Fifty-Fourth Annual Commencement, Howard University, June 8, 1923*, Commencement Program, Howard University, Washington, DC, 1923, p 7.
127. M. Feldman and P. Hudrlik, "Science Education at Howard University 1910-1960 and the Development of the Ph.D. Program," in *Quest*, pp 4-8, https://chemistry.howard.edu/sites/chemistry.coas.howard.edu/files/2021-02/Quest_2008-spr_4-8_HU-history.pdf (accessed Jan. 20, 2021).
128. A. A. Taylor, "Graduate Work at Fisk University," Special Collections and Archives, Fisk University, 1937.
129. S. N. Collins, "Robert Percy Barnes: From Harvard to Howard University," *Bull. Hist. Chem.*, **2015**, *40*, 37-39.
130. There is some discussion about whether the first Master of Science degrees requiring a research thesis at an HBCU were granted at Howard University or at Fisk University. Ref. 125 describes the start of the graduate program at Howard. Refs. 128 and 131 describe the situation at Fisk University. It is clear that a program comparable to Howard's did not start at Fisk until 1927, when St. Elmo Brady went back to Fisk as Head of the Chemistry Department. Ref. 128 does not indicate whether Brady was involved in this effort, although it seems telling that a single page, authored by Brady and describing the requirements for the master's degree in chemistry, was part of this document.
131. J. M. Richardson, *A History of Fisk University 1865-1946*, University of Alabama Press, Tuscaloosa, AL, 1980, p 117.
132. *Fifty-Sixth Annual Commencement, Howard University, June 25, 1925*, Commencement Program, Howard University, Washington, DC, 1925, p 7.
133. *Fifty-Eighth Annual Commencement, Howard University, June 10, 1927*, Commencement Program, Howard University, Washington, DC, 1927, p 14.
134. H. W. Woodson, "The Present Status of Chemistry in Negro Colleges," *J. Chem. Educ.*, **1940**, *17*(3), 111-116.
135. "Watson Will Coach Howard Grid Team," *Evening Star* (Washington, DC), Dec. 14, 1924, p 98.
136. Ref. 37, p114.

137. S. P. Massie, "St. Elmo Brady, A Pioneer," *Boulé J.*, **1979**, 42(3), 12, 56
138. Ref. 37, p 117.
139. "Dr. St. Elmo Brady," *Fisk University News*, October 1928, 2(1), 1.
140. "Fisk's School Of Chemistry Finest In Country, Report," *Pittsburgh Courier*, July 20, 1929, p A2
141. "Fisk Loses Science Building in Fire," *Birmingham Reporter* (Birmingham AL), Nov. 16, 1929, pp 5, 8.
142. "The New Chemistry Building," *The Fisk Herald* (Nashville, TN), Oct. 31, 1931, pp 1-2.
143. Ref. 37, p 72.
144. Personal communication, Brandon A. Owens, Sr. (Director of Library Services, Fisk University), 2021.
145. "St. Elmo Brady Re-Elected; Heads Southern Conference," *Chicago Defender* (National edition), Dec. 18, 1937, p 10.
146. R. J. Reed, "Sigma Pi Phi Fraternity, The Boulé: A Brief Overview (1904-)," <https://www.blackpast.org/african-american-history/sigma-pi-phi-fraternity-the-boule-a-brief-overview-1904/> (accessed Dec. 11, 2020).
147. "Alpha Phi Alpha," https://en.wikipedia.org/wiki/Alpha_Phi_Alpha (accessed Dec. 11, 2020).
148. S. E. Brady, "Phytochemical Study. Seeds of the Magnolia Grandiflora," *J. Am. Pharm. Soc.*, **1938**, 27, 404-417.
149. S. E. Brady, "Ricinus communis. I. Oxidation of Ricinoleic Acid," *J. Am. Chem. Soc.*, **1939**, 61, 3464-3467.
150. S. E. Brady and S. P. Massie, "1,1-Dichloroheptane," *Proc. Okla. Acad. Sci.*, **1952**, 33, 261-262.
151. R. P. Torrey, Assistant Vice President for Research, Research Office Tennessee Tech. P.O. Box 5036, Crookville, TN 38505, personal communication, 2005.
152. "Dr. St. Elmo Brady Retires," *Fisk News*, **1952**, 26, p 10.
153. St. Elmo Brady Retirement Binder, May 30, 1952, Personal Collection, Carol Brady Fonvielle.
154. A. Goldstein, Phi Beta Kappa Society, Washington, DC., personal communication, 2005.
155. *Fisk News*, **1966**, 40(Winter), 19-20.
156. R. E. Mickens, "The Life and Work of Elmer Samuel Imes," *Physics Today*, **2018**, 71(10), 28-35. Imes was employed in New York City as a physics consultant and also worked in R & D with three different engineering firms from 1918-1930. Imes and his wife, the writer Nella Larsen, were married in 1919, and were both involved in the Harlem Renaissance movement in New York City. Imes returned to Fisk University (BA 1903, MA 1915 from Fisk) as a professor of physics. His wife, who "had no interest in living in the racially segregated South," remained in New York City when he left. Their separation eventually led to a divorce in 1933.
157. "Deaths—Brady, Robert Travers," *Evening Star* (Washington, DC), Aug. 8, 1928, p 9.
158. "Biographies of NBNA Members," *Maricopa County Sheriff's Office History and Pictorial*, p 84, <https://books.google.com/books?id=mjXQ5AmSwPAC&pg=RA1-PA84> (accessed Dec. 11, 2020).
159. "Beryl Alice Brady 1951-1994," https://www.myheritage.com/names/beryl_bradly (accessed Dec. 11, 2020).
160. "Blast Injures Doctor Held in Narcotics Case," *Salisbury Times* (Cambridge, MA), Aug. 24, 1953, p 1.
161. "Rites Set Today for Cambridge Physician," *Salisbury Times* (Cambridge, MA), Aug. 27, 1953, p 9.
162. Some insight into Brady's retirement from Fisk can be found in Brady's personal datebook dated 1938 but likely used in 1950-1952; it contains his thoughts on research topics, abstracts of papers, and a series of notes related to a dispute with upper administrators at Fisk University.
163. Tougaloo College, Our History, <https://www.tougaloo.edu/about-tougaloo-college/our-history> (accessed Dec. 11, 2020).
164. "Tougaloo College," https://en.wikipedia.org/wiki/Tougaloo_College (accessed Dec. 11, 2020).
165. R. McGinnis, Professor of Chemistry, Dean of Natural Sciences, Tougaloo College, personal communication, 2005.
166. *Noyes Laboratory at the University of Illinois*, National Historic Chemical Landmark, American Chemical Society, <https://www.acs.org/content/acs/en/education/whatischemistry/landmarks/noyeslaboratory.html> (accessed Dec. 1, 2020).
167. *St. Elmo Brady*, National Historic Chemical Landmark, American Chemical Society, <https://www.acs.org/content/acs/en/education/whatischemistry/landmarks/st-elmo-brady.html> (accessed Dec. 1, 2020).
168. "Twenty Whites & One 'Other'": St. Elmo Brady, First African American Ph.D. in Chemistry, <https://www.youtube.com/watch?v=cGJ681TfBYs> and <https://chemistry.illinois.edu/diversity-university-illinois> (accessed Dec. 3, 2020).
169. L. Wang, "St. Elmo Brady Gains Chemical Landmark Status," *Chem. Eng. News*, **2019**, 97(27), 33.

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