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# Breidenbaugh to Zinn: The Evolution of Chemistry at Gettysburg College

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# Breidenbaugh to Zinn: The Evolution of Chemistry at Gettysburg College

## Description

For students at Gettysburg College, there are many departments from which one can choose to make their major course of study. Included among these courses of study is the chemistry department. Though the chemistry department might seem like a stagnant, fixed part of the Gettysburg curriculum, it has not always been that way. For about the past 125 years, the chemistry department has seen a world of change from the time that it finally separated from the physical sciences and became its own department to the changing of omnipresent faculty, the chemistry department has evolved over time to become what it is today. Through an examination of how the department developed when its leadership changed from that of Dr. Edward S. Breidenbaugh to Dr. John B. Zinn, a greater understanding of chemistry at Gettysburg can be reached. [excerpt]

## Course Information:

- Course Title: *HIST 300: Historical Method*
- Academic Term: Spring 2010
- Course Instructor: Dr. Michael J. Birkner '72

*Hidden in Plain Sight* is a collection of student papers on objects that are "hidden in plain sight" around the Gettysburg College campus. Topics range from the Glatfelter Hall gargoyles to the statue of Eisenhower and from historical markers to athletic accomplishments. You can download the paper in pdf format and click "View Photo" to see the image in greater detail.

## Keywords

Gettysburg College, Hidden in Plain Sight, Chemistry Department, Edward S. Breidenbaugh, John B. Zinn

## Disciplines

Public History | United States History

## Campus Location

Breidenbaugh Hall

Gettysburg College

Hidden in Plain Sight

Breidenbaugh to Zinn: The Evolution of Chemistry at Gettysburg College

History 300

Historical Methods

Dr. Michael Birkner

By

Rachael Surmick

Spring 2010

For students at Gettysburg College, there are many departments from which one can chose to make their major course of study. Included among these courses of study is the chemistry department. Though the chemistry department might seem like a stagnant, fixed part of the Gettysburg curriculum, it has not always been that way. For about the past 125 years, the chemistry department has seen a world of change from the time that it finally separated from the physical sciences and became its own department to the changing of omnipresent faculty, the chemistry department has evolved over time to become what it is today. Through an examination of how the department developed when its leadership changed from that of Dr. Edward S. Breidenbaugh to Dr. John B. Zinn, a greater understanding of chemistry at Gettysburg can be reached.

Professor E.S. Breidenbaugh is one of the legendary faculty members of Gettysburg College. This is reflected in the presence of an academic building dedicated to him and the work he accomplished at Gettysburg. During his time at the college, he was Professor of Chemistry and Mineralogy from 1874-1924.<sup>1</sup> Professor Breidenbaugh's fifty years as a faculty member were also the first fifty years of the chemistry department. The Gettysburg College Department of Chemistry was formed in 1874 when Professor Sadtler resigned as chair of the Department of Physical Sciences, and it was at this time that Breidenbaugh was elected as the Ockerhausen Professor of Chemistry and Mineralogy.<sup>2</sup> In this way, E.S. Breidenbaugh saw the birth of the study of chemistry at Gettysburg College during his time here and left a lasting mark on the

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<sup>1</sup> *The Alumni Record of Gettysburg College 1832-1932* ( York, PA: Maple Press Company, 1932), 69.

<sup>2</sup> E.S. Breidenbaugh ed., *The Pennsylvania College Book 1832-1882* (Philadelphia: Lutheran Publication Society, 1882), 25.

department. To honor his dedication to the college, he was named Professor Emeritus of Chemistry upon his retirement.<sup>3</sup>

Professor Breidenbaugh left a lasting legacy at Gettysburg College, though one must look through the college's façade to find it. He was respected by his students who looked to him as a guiding light; what is more, one of his students thought that he should have a building dedicated to him.<sup>4</sup> His integrity survives him. However, the most visually obvious monument to Professor Breidenbaugh's accomplishments and dedication to the college is Breidenbaugh Hall. The building was built in 1927 and was officially dedicated to him on June 12, 1929 during the commencement festivities.<sup>5</sup> Since its dedication, the building was generally referred to as the Science building. In 1966, Breidenbaugh's successor, Dr. John B. Zinn decided that it was necessary for a portrait of Breidenbaugh to hang in the building.<sup>6</sup> The building will forever be a testament to the dedication of one professor to his profession and this institution.

Breidenbaugh Hall was built during the late 1920s, and this was a time of great physical change to the Gettysburg College campus. As Breidenbaugh Hall was being erected on campus, so was Plank Gymnasium, both projects part of the "Greater Gettysburg Program."<sup>7</sup> The groundbreaking ceremony for the building demonstrates the change that Gettysburg College was experiencing at the time. Present at the ceremony, were Dr. Henry Hanson, president of the college; George C. Baum, architect for the building and Gettysburg College graduate; Dr. E.S. Breidenbaugh, former chemistry department head; and Dr. John B. Zinn, Dr. Breidenbaugh's

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<sup>3</sup> Gettysburg College Board of Trustees, December 9, 1924 Minutes in *Board of Trustees: Gettysburg College; Minutes 1921-31*, Musselman Library, Special Collections.

<sup>4</sup> "Dr. Breidenbaugh," *Gettysburg Challenger*, Thursday, May 26, 1921, in E.S. Breidenbaugh Vertical File, Musselman Library Special Collections.

<sup>5</sup> Charles H. Glatfelter. *A Salutary Influence: Gettysburg College: 1832-1985 Volume 2* (Mechanicsburg, PA: W&M Printing, 1987), 580.

<sup>6</sup> "Portrait of Prof. E.S. Breidenbaugh To Hang In Chemistry Building Lobby," *Gettysburgian*, January 1, 1966.

<sup>7</sup> "Breidenbaugh Hall- A Brief History," E.S. Breidenbaugh Vertical File, Musselman Library Special Collections.

successor.<sup>8</sup> As the building project began, the faculty that would walk its halls was in flux. The old chemistry laboratory representing the old, Dr. Breidenbaugh, was brought down as the new chemistry laboratory was brought up, representing the new and fresh Dr. Zinn.

Despite the potential logistical nightmare of two building projects occurring simultaneously, the construction of the building began on schedule. Work on the new Science Building commenced in the winter of 1925-26, and the first classrooms were used in the fall of 1927.<sup>9</sup> However, the building construction did encounter a few snags. There was a lack of communication between the architect and the college regarding specifics about the building. These include issues of decisions to be made by the architect such as specifics about work on the heating and plumbing systems for the building.<sup>10</sup> This was not the only setback the college experienced. The college had difficulty choosing what hardware to use in the building, which was the ultimate delay the construction crew encountered.<sup>11</sup> Construction impediments aside, the building was completed by 1929 and dedicated to Professor Breidenbaugh during June of that year. Upon completion, the new chemistry building was a state of the art building for its time. The building and the facilities found within were of much greater quality than “that old apology of a Chemistry laboratory in which Breidy has wrought so long and well.”<sup>12</sup> The new science building represented all that was changing at Gettysburg, bringing the college into the future.

Though the new science building was built in honor and dedicated to Professor Breidenbaugh, it was not built for him. In fact, it was by his successor that the building was used. Professor Breidenbaugh was succeeded by Dr. John B. Zinn, class of 1909. Upon

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<sup>8</sup> Breidenbaugh Groundbreaking, Plank Gymnasium groundbreaking, Football game – Gettysburg vs. Lehigh, copy from 35mm film, Musselman Library, Special Collections, Archival Film Collection.

<sup>9</sup> Charles H. Glatfelter. *A Salutory Influence*, 580

<sup>10</sup> Letter from A.R. Warner to Dr. Henry Hanson, Henry W.A. Hanson Papers, Building Committee 1927, Musselman Library Special Collections.

<sup>11</sup> Letter from Edward A. Early via the Office of George C. Baum to Dr. Henry Hanson, February 23, 1927, Henry W.A. Hanson Papers, Building Committee 1927, Musselman Library Special Collections.

<sup>12</sup> Charles F. Sanders, “A \$700,00 Building Program,” *The Gettysburg Alumnus*, Volume 1, No. 2 (1930), 4.

graduating from Gettysburg, Dr. Zinn went on to Johns Hopkins University to earn his doctorate in chemistry in 1913.<sup>13</sup> Dr. Zinn was beginning to make a name for himself in the field and went on to teach at other institutions before finally coming to Gettysburg. Dr. Zinn taught as an instructor of chemistry at Amherst College from 1913 to 1919 and taught as a professor at Worcester Polytechnic Institute from 1919 to 1924.<sup>14</sup> From 1924 to his retirement, Dr. Zinn was head of the chemistry department at Gettysburg College. Dr. Zinn's scholastic accomplishments include his dissertation on osmotic pressure and other papers that focused on measuring carbon dioxide.<sup>15</sup> Dr. Zinn was an talented professor and chemist, and it worth examining his reasons for returning to Gettysburg College as a member of the faculty.

As a young and up and coming scientist, the question lingers as to why Dr. Zinn would return to his alma mater to teach. Dr. Zinn was not only a Gettysburg College graduate, but he was also a Gettysburg area native. In 1905, Dr. Zinn graduated from Gettysburg High School.<sup>16</sup> John Zinn grew up in the Gettysburg area, so it seems logical that he would want to return his birthplace to start and raise his own family. Furthermore, his son John B. Zinn, Jr. has indicated that his ties with the town of Gettysburg were influences in his return to Gettysburg College.<sup>17</sup> Gettysburg, Pennsylvania was Dr. Zinn's home and when the opportunity to return was presented to him, it appears as though he was intrigued by the offer.

However, it does appear that some convincing was necessary for Dr. Zinn to return to Gettysburg as a faculty member. When looking at the record of the minutes for the Board of Trustees at this time, the word "obtained" is used to describe the way in which Hanson brought

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<sup>13</sup> Clyde B. Stover and Charles W. Beachem, *The Alumni Record of Gettysburg College 1832-1932* (Gettysburg, PA; Gettysburg College, 1932), 257.

<sup>14</sup> *Ibid.*, 257.

<sup>15</sup> "Alumni News: Dr. John B. Zinn '09 Has Been Active in Field of Chemistry," *Gettysburgian*, January 18, 1928.

<sup>16</sup> *Ibid.*, 257.

<sup>17</sup> John B. Zinn, Jr. Telephone Interview with Rachael Surmick, February 19, 2010.

to Zinn to the college.<sup>18</sup> Thought it may seem trivial, the fact that Hanson used the work obtained means quite a bit. It suggests that there was a reason Zinn was being sought after, indicating that Zinn could bring something unique and beneficial that no other potential for Breidenbaugh could. At this time, Dr. Zinn and other Gettysburg College graduates were being sought after by Henry Hanson to return to teach, and Henry Hanson offered the permanent position of head of the chemistry department to Dr. Zinn in 1923.<sup>19</sup> This position offered amazing job stability for this man, and job stability means financial security. Though there is no way that Dr. Zinn could have known this, his acceptance of this post occurred just years before the United States experienced its worst economic depression. There is no doubt that institutions everywhere suffered losses during these turbulent times; however, Dr. Zinn's position was secured.

Teaching at Gettysburg presented many opportunities to Dr. Zinn. As a head of a department he was able to "be his own boss."<sup>20</sup> That he was head of department for about thirty years is not a normal occurrence at any institution. Today, all departments rotate the chair position among permanent faculty members. Dr. Zinn was at the top of the Gettysburg College chemistry ladder for his entire Gettysburg teaching career. Also, Dr. Zinn was instrumental in the design of Breidenbaugh Hall. It was Dr. Zinn who approved the materials used in the laboratories. For example, Dr. Zinn gave his assent to the use of General Ceramics and Knight Acid Proof Stone.<sup>21</sup> The quality of these wares were then validated by contacting the manufacturer, who described its excellence by stating what other institutions use it, one of which

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<sup>18</sup> Minutes, December 9, 1924, Gettysburg College Board of Trustees, Musselman Library Special Collections, 83.

<sup>19</sup> John B. Zinn, Jr. Telephone Interview with Rachael Surmick, February 19, 2010.

<sup>20</sup> Ibid.

<sup>21</sup> Letter from Office of George C. Baum via L. de Forest Emmert to Henry Hanson, February 12, 1927, Building Committee 1927, Henry W. A. Hanson Papers, Musselman Library Special Collections.

was Johns Hopkins University.<sup>22</sup> Dr. Zinn earned his doctorate at Johns Hopkins University, and in this way, it appears as if he was attempting to bring Gettysburg College to the same caliber as other schools in the area.

There was also a significant shift in the way chemistry was taught at Gettysburg when Dr. Zinn arrived. The curriculum of Dr. Breidenbaugh was much different than that of Dr. Zinn. Required courses to major in chemistry under Dr. Breidenbaugh included General Chemistry, two courses in Qualitative Analysis, Organic Chemistry, Special Qualitative Analysis, and Industrial Chemistry.<sup>23</sup> Changes that Dr. Zinn was responsible for when he arrived at Gettysburg include revisions that he made to Dr. Breidenbaugh's curriculum. For example, a student majoring in chemistry when Dr. Zinn became head of the department included courses in General Chemistry, two years of Qualitative Analysis, and Organic Chemistry.<sup>24</sup> This differs from the curriculum that his predecessor had set in place. One of the more obvious changes is that Industrial Chemistry was removed. Additionally, as some courses were eliminated, other courses were added. During Breidenbaugh's time, there was no course on Physical Chemistry offered at Gettysburg; however, when Dr. Zinn came to the college, one such course was designed.<sup>25</sup> In this way, Dr. Zinn reformed the Gettysburg College chemistry curriculum, and in doing so he brought it up to date.

The modifications that Dr. Zinn made to the old curriculum were possible in part due to the new facilities available to him in Breidenbaugh Hall. For example, the old description of the Physical Laboratory does not mention its ability to support research and experimentation;

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<sup>22</sup> Letter from Maurice A. Knight to Allan B. Plank, March 11, 1927, Building Committee 1927, Henry W. A. Hanson Papers, Musselman Library Special Collections.

<sup>23</sup> Gettysburg College Catalog Volume 12, No. 3 (Gettysburg, PA: Gettysburg College, ND), 66-68.

<sup>24</sup> Gettysburg College Catalog Volume 18, No. 1 (Gettysburg, PA: Gettysburg College, ND), 49-50.

<sup>25</sup> *Ibid.*, 49-50.

however, the first part of the description of the Physical Laboratory in Breidenbaugh claims immediately that it “provides ample space for experimental work.”<sup>26</sup> As amazing as an instructor can potentially be, there are certain restricting factors that can change the learning environment for students. In this case, it appears as though the construction of Breidenbaugh Hall opened up the opportunity to explore different subfields of chemistry that were not available in the old Chemistry Laboratory. Additionally, the size of Breidenbaugh Hall influenced the type of work that could be accomplished in the building. For example, the old Chemistry Laboratory only had three laboratory facilities.<sup>27</sup> This size was simply inadequate to accommodate all of the students. Breidenbaugh Hall, on the other hand, had five laboratory facilities.<sup>28</sup> The work that could be accomplished with larger and better facilities that Dr. Zinn worked in would be far superior to that in which Dr. Breidenbaugh worked.

Dr. Zinn did not stop his scholarship upon his arrival at the college. On the contrary, Dr. Zinn ensured that the rest of the college community was made aware of what was occurring in his academic field. Included among the many aspects of his scholarship was that he traveled to other institutions to attend conferences and lectures on new developments in chemistry. On many occasions, Dr. Zinn went to Johns Hopkins University. In 1925, Dr. Zinn went to an American Chemical Society (of which he was a member) conference at that institution and reported back to the campus community what was currently occurring in the world of chemistry, which at this time was organic chemistry.<sup>29</sup> However, his academic excursions were not just centered on attending conferences. During another trip to Johns Hopkins University, Dr. Zinn met with eight research scientists who were working with refrigeration devices and toured their

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<sup>26</sup> Ibid, 136.

<sup>27</sup> *Gettysburg College Catalog*, Volume 12, No. 3, 123.

<sup>28</sup> *Gettysburg College Catalog*, Volume 18, No.1, 139.

<sup>29</sup> “Chemists Attend Meeting At Hopkins,” *Gettysburgian*, April 29, 1925.

physical chemistry department.<sup>30</sup> Dr. Zinn was also enthusiastic when it came to sharing his knowledge. Through radio shows, Dr. Zinn made chemistry available to everyone on campus.<sup>31</sup> Dr. Zinn was an avid chemist, but that was not the only thing he was passionate about at Gettysburg.

Dr. Zinn was extremely dedicated to the advancement of his students and arranged various extracurricular learning opportunities to occur on campus to be presented to chemistry students for their enrichment. For example, the chemical society on campus, Sceptical Chymists, hosted an intercollegiate conference of student chemists in 1942, and the same group traveled with Dr. Zinn to other colleges for similar conferences.<sup>32</sup> By doing this, Dr. Zinn presented his students with the opportunity to network and meet other students who were pursuing similar goals. In doing so, he gave his students invaluable experiences. Dr. Zinn also helped his students stand out on an intercollegiate basis as well. The general chemistry students won a competition against Haverford College in 1933, and the students that represented Gettysburg were taught by Dr. Zinn as opposed to the students who were taught by other members of the chemistry faculty.<sup>33</sup> Additionally, Dr. Zinn also made it possible for students to hear speakers on campus. For example, Dr. Zinn brought an organic chemist to the campus to speak to students in the Industrialist's and Men's Business Program.<sup>34</sup> Dr. Zinn's dedication to his students is reflected in the opportunities he provided them. The relationship that Dr. Zinn cultivated with his students created a trust between them. In 1939, it is possible that the first hint toward a campus wide Honor Code was implemented on campus. This occurred in the chemistry department with Dr. Zinn's advanced chemistry students enrolled in organic chemistry, and the

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<sup>30</sup> "Dr. Zinn Visits Johns Hopkins University," *Gettysburgian*, January 25, 1928.

<sup>31</sup> "Dr. Zinn Talks About Science," *Gettysburgian*, December 14, 1933.

<sup>32</sup> "Chemist Society Will Meet Here," *Gettysburgian*, May 1, 1941.

<sup>33</sup> "Campus Wins In Chemistry," *Gettysburgian*, May 25, 1933.

<sup>34</sup> "Industrialists Meet Saturday," *Gettysburgian*, May 26, 1932.

conduct of these students was governed by a set of rules that Dr. Zinn helped the students devise.<sup>35</sup> The enrichment Dr. Zinn's students experienced was not one solely based on academic achievement; it also reflected character building and the integrity of the individual.

Dr. Zinn has left a lasting legacy at Gettysburg College, and though he has been gone from the college for many decades, his presence is still here. This is evident in the memorial lecture series and a scholarship created in his honor. In 1981, Gettysburg College decided to create what is called the John B. Zinn Memorial Fund for Professional Excellence in the Healing Arts. Of the money in the fund, eighty percent is used for the advancement of courses that prepare Gettysburg students for graduate programs in the medical field, and the other twenty percent is used to fund student research.<sup>36</sup> In this way, Dr. Zinn continues to help Gettysburg College students despite the fact that he is long since gone from this institution. Additionally, Dr. Zinn's spirit of bringing outside sources to the college to lecture to its students is not forgotten. Beginning after his retirement, a seminar series was started in his honor, and one of the first guest lecturers was chemist Friedrich Cramer from what was then West Germany.<sup>37</sup> Dr. Zinn has been memorialized at Gettysburg College not by a building, but through a continuing effort to bring knowledge to Gettysburg College students.

There is much more to the study of chemistry at Gettysburg College than simply the memorization of chemical processes and atomic structures in which current students spend hours engrossed. There is a history, and that history revolves around the people who have made the chemistry department what it is today. Those people are Dr. E.S. Breidenbaugh and Dr. John B. Zinn. As a testament to Dr. Breidenbaugh's work at Gettysburg, a building currently stands on

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<sup>35</sup> "Chem Majors Introduce New Honor System," *Gettysburgian*, December 14, 1939.

<sup>36</sup> "College to Establish Zinn Memorial Fund," *Gettysburgian*, March 13, 1981.

<sup>37</sup> "Visting Scientist From Western Germany To Talk at Second John B. Zinn Seminar," *Gettysburgian*, March 18, 1960.

the campus in his honor. This building was then used by his successor Dr. Zinn to foster an atmosphere of scholarship and excellence. Dr. Zinn's legacy at Gettysburg is much different than that of Dr. Breidenbaugh. Dr. Zinn does not have a building dedicated to him; however, a memorial fund was created in his honor, which students still benefit from today in addition to a seminar series created to mimic his spirit of scholastic achievement. Gettysburg College helped create two fine scientific minds, which in return brought their knowledge and experience back to their alma mater to help shape the minds of future chemists.

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