

## Tau Beta Pi Woman's Badge Recipients at Iowa State



The year 2019 marks the 50th anniversary of women becoming members of Tau Beta Pi. Prior to that time women who met the qualifications for Tau Beta Pi could be awarded a Tau Beta Pi Women's Badge (shown above), but were not accorded full membership. Following is a historical account of the creation of the Woman's Badge and information about the eight Iowa State women engineering students who were Iowa Alpha Woman's Badge recipients.

Membership of women in Tau Beta Pi – the National Engineering Honor Society first became an issue in 1903 when a woman in Architectural Engineering at the University of Illinois headed her class and was elected to membership by Illinois Alpha. The Tau Beta Pi Executive council that year refused to approve the female student's election to membership. Illinois Alpha appealed to the Convention, but delegates voted to uphold the Council's decision and the Constitution was hastily edited to insert the word "male" wherever appropriate.

The ban on women remained intact until 1936, when the Tau Beta Pi Convention delegates authorized presentation of the Tau Beta Pi Woman's Badge to women in engineering who met the requirements for Tau Beta Pi membership. However, the Badge did not represent membership in Tau Beta Pi and it was not until 1969 that women were accorded full Tau Beta Pi membership. Between 1938 and 1968, a total of 619 Woman's Badges were awarded by 98 Tau Beta Pi chapters throughout the United States. Eight Woman's Badges were awarded by the Iowa Alpha Chapter of Tau Beta Pi.

In 1969 the 619 Woman's Badge recipients did not automatically become Tau Beta Pi members, but they were offered membership. In 1970 four Iowa Alpha Woman Badge holders became Tau Beta Pi members, including the first two recipients who became Iowa Alpha's first women members.

In recognition of the contributions Iowa Alpha's Tau Beta Pi Woman's Badge recipients made to furthering the acceptance of women in engineering at Iowa State and in the engineering profession, the Chapter had a commemorative pavement stone installed in their honor in the Iowa State Plaza of Heroines in 2007 on the occasion of the Iowa Alpha centennial.

The first two Iowa State recipients of the Tau Beta Pi Woman's Badge, Eloise (James) Zimmerman, Architectural Engineering, and Mary (Krumboltz) Hurd, Civil Engineering, were featured in the Des Moines Register on 9 June 1946.



“In Iowa State’s total enrollment of 5,907 for the quarter ending June 14, are 1,863 girls. Twenty-three take engineering along with 1,533 men. Engineering Seniors are Mary Krumboltz of Ames (red jacket in the photo) and Eloise James of Davenport, working at a testing machine. Mary, first woman editor of the “The Iowa Engineer,” may go into engineering journalism. Eloise was the first girl ever to receive a Woman’s Badge from Tau Beta Pi. She is in Knights of St. Patrick, another honorary engineering fraternity.”

The following information on Iowa Alpha’s Woman’s Badge recipients is based upon Iowa State University Alumni records, documents in the archives of the Iowa State University Library and personal correspondence with the recipients.

### **Eloise (James) Zimmerman**

Eloise (James) Zimmerman was the first Iowa Alpha recipient of the Tau Beta Pi Woman’s Badge receiving badge number 26 on 23 May 1945. She was one of Iowa Alpha’s first women to be accorded full Tau Beta Pi membership being initiated by Iowa Alpha on 16 May 1971.

The only woman in many of her college courses, as well as the advance high school courses she took preparing for college, she recalled having a feeling that women were being discouraged from a career in Architectural Engineering. She considered one of her greatest thrills in college being selected as the first Iowa State recipient of the Tau Beta Pi Woman’s Badge.

While a student she spent 2 summers worked for Temple and Temple, Davenport architects. After graduating from Iowa State with a Bachelor of Science in Architectural Engineering in 1946, she accepted employment with Temple and Temple in Davenport,

working for them until 1947. Following her marriage to Robert Zimmerman in 1948, she was employed for six months in the Department of Architectural Engineering at Iowa State, while her husband was finishing his degree, after which they moved to Bettendorf, Iowa.

Marriage and motherhood brought no termination to her architecture career. After working as an architect for three years, she passed the four day State Examination and received her professional license to practice architecture in 1952.

She specializing in the design of homes in the quad-city area and Ames. However, she also designed Iowa State's television station and several other campus buildings. She was active in the quad-city community spending 10 years on the school board, and assisting her husband in the manufacturing company they owned.

Eloise Zimmerman died on 1 June 1971, only 2 weeks after her initiation as a Tau Beta Pi member.

### **Mary (Krumboltz) Hurd**

Mary (Krumboltz) Hurd was the second Iowa Alpha recipient of the Tau Beta Pi Woman's Badge receiving badge number 42 on 28 May 1946. She was one of Iowa Alpha's first women to be accorded full Tau Beta Pi membership being initiated as a member of Iowa Alpha on 18 June 1971

She recalled that her skills and interest in math and science, and a desire to be self-supporting, had brought her to Iowa State to study engineering. She was the only women in her engineering classes. While a student, she served as editor of the "Alumnitems" magazine and in 1945 was elected editor of Iowa State's "Iowa Engineer", the first woman to hold that position.

Following graduation with a Bachelor of Science in Civil Engineering in 1947, she learned that the American Concrete Institute in Detroit was looking for someone with an engineering degree and writing skills. With her editorial experience and engineering skills she seemed to be perfect for the position, except they did not want a woman. However, an ISU professor with connections to the American Concrete Institute interceded on her behalf, and she got the job.

Over the next several years, she started a family, pursued graduate study and worked on municipal engineering and land surveying projects. In 1956, she became associate editor of the Journal of the American Concrete Institute, leaving that position three years later to become an independent engineering writer and consultant.

In the early 1960s, the American Concrete Institute determined that since no definitive work on concrete formwork existed in the United States, they would publish one. They requested that she prepare it. Her book, Formwork for Concrete, was first published by the American Concrete Institute in 1963, and she has since been revised it

six times. In all, the seven editions have sold more than 125,000 copies, and the book has grown from 350 to 500 pages. It is used as a textbook at universities, colleges, and professional schools and as a reference book throughout the industry. It is widely known as “the green bible of the formwork industry .” and has also been translated into several foreign languages.

In 1963, when the book was being published, she believed that it would be a disadvantage for the book to have a female name on it. Therefore, she used her initials “M. K.” and the name of the author, M. K. Hurd, stayed that way through each revision. Only in recent years has it become generally known the author was a woman. She recalled that as a woman working in a predominantly male industry she felt obligated to do a better job than the typical man. In 2004 her success in this regard was attested to by Ward R. Malisch, senior managing director for the American Concrete Institute, who wrote: “Mary’s Formwork for Concrete is the most influential concrete formwork book ever written. Her knowledge of concrete construction is surpassed only by her ability to describe it lucidly, concisely, and in a most interesting fashion.”

In 1976 she began working as an engineering writer/consultant, preparing technical reports and programs for companies and individuals. In 1981 she became the editor-in-chief of Concrete Construction and later served as the senior engineering editor. Her skills and determination served her well, and over the years she has conducted dozens of seminars and lectures, and published more than 230 journal articles.

She was a member of numerous societies and organizations, including the Society for Technical Communication, the American Society of Civil Engineers (Life Member), and is a Fellow of the American Concrete Institute. In 2004 she became the first female recipient of the Marston Medal, the highest award bestowed by the ISU College of Engineering, which honors college alumni for outstanding achievement in engineering and is named for Anson Marston, Iowa State’s first engineering dean. She also received the Henry C. Turner Medal from the American Concrete Institute and was recognized alongside Thomas Edison by the *Engineering News Record* as one of the construction industry’s “top 125 people of the past 125 years.”

In 2011 Iowa Alpha nominated her for the Tau Beta Pi Distinguished Alumnus Award, but the nomination was not successful. In 2013 she was selected to receive the Alumni Merit Award by the ISU Alumni Association. Unfortunately, Mary Hurd passed away September 27, 2013, just weeks before she was scheduled to receive this honor.

### **Jane (Frudden) Templeman**

Jane (Frudden) Templeman was the third Iowa Alpha recipient of the Tau Beta Pi Woman’s Badge, graduating from Iowa State with a Bachelor of Architecture in 1953. She considered herself greatly honored to have been awarded the Tau Beta Pi Woman’s Badge, but recalls being excluded from attending Iowa Alpha meetings and other chapter activities.

In the spring of 1953 she was the recipient of the Alpha Rho Chi medal, awarded by the Department of Architecture to a graduating senior for leadership, scholarship and merit. Upon graduation she found that no architectural firms would grant her an interview and was hired by the Meredith Publishing Co. in Des Moines as assistant to the Building Editor of Better Homes and Gardens. The Building Editor was also a licensed architect, and in addition to her regular job, she worked for him part-time in the evenings and on weekends.

In the summer of 1954 she married Dr. Clyde C. Templeman, a veterinarian, and moved to Williams, a community of 500 people in central Iowa, where she became active as a wife and mother, raising a family of three children, serving as receptionist for her husband's veterinary practice and providing support and leadership in local community, church and school activities.

In 1977 she resumed her career as an architect, being hired by the architectural firm of Kivett and Myers/a division of Howard, Needles, Tammen and Bergendoff in Kansas City to write construction specifications. She also served on the national board of directors for the Construction Specifications Institute. In 1982 she passed her licensing exam and became an Architect Member (AIA) of the American Institute of Architects. She later took a position as project manager for the Kansas City office of HOK Architects and in 1990 she was the first woman selected as president-elect of the Kansas City chapter of the American Institute of Architects. While she considered the study and practice of architecture a wonderful experience and enjoyed interacting with the interesting and creative people she met working as an architect, in 1990 she gave up her professional career to return home to Iowa to care for an elderly parent.

An ISU Foundation governor (emerita) and a past member of the ISU Alumni Association Executive Committee, Jane Templeman is now retired and living in California.

### **Judy (Risdall) May**

Judy (Risdall) May was the fourth Iowa Alpha recipient of the Tau Beta Pi Woman's Badge receiving badge number 217 on 29 January 1957. She graduated from Iowa State with a B.S. in Chemical Engineering in 1958. She was one of Iowa Alpha's first women to be accorded full Tau Beta Pi membership being initiated as a member of Iowa Alpha on 14 May 1971.

After graduation she moved to Corpus Christi, Texas, to work as a cost estimator for Columbia-Southern Chemical Corp, a division of Pittsburgh Plate Glass Company. She was the first woman to work in their pilot plant, gaining practical experience in designing a cost effective process for producing chemical products. However, because of resistance to a woman working in the pilot plant, before being "allowed" to work there she had to obtain special dispensation from the company.

After three years in Texas, she was hired by Douglas Aircraft Company (later part of McDonnell-Douglas and now Boeing) and moved to Santa Monica, California to work in their plasma jet testing facility, where the ablative properties of materials used to build the aircraft were determined. After a layoff, she was hired by IBM as a Systems Engineer and trained in programming, wiring boards for their business equipment, and acting as a bridge between IBM and engineers at the North American Aviation facilities in southern California. Having had no prior computer exposure, she credited her engineering education at Iowa State and her training at IBM with her success in performing these new responsibilities.

In 1964, she married Roger May, an electrical engineer from the University of Michigan, whom she had met while working at Douglas Aircraft. At that time, California state law would not allow women to work after the 7 month of pregnancy. Therefore, she was forced to end her employment at IBM when she and her husband were expecting their first child and she became a "stay-at-home" mom for the next 17 years, raising a family of 2 girls and a boy. During this time, she volunteered at her children's school, setting up and teaching various scientific programs and classes and was president of the P.T.A. In 1976 she received the California Honorary Service Award for the contributions she had made to the school.

In 1981, at the age of 45, she "re-entered" the work force being hired by Hughes Space and Communications Company as a material and process engineer, with a strong emphasis on thermal passive control materials and processes. In 1986 she received a NASA Certificate of Recognition for the creative development of a material for the radar and communications sub-system for the Space Shuttle. This was followed in 1990 by the Top Cost Improvement Award at Hughes Space and Communications Company (over \$9 million dollars in savings in the thermal blanket material and production area); presented to her by the president of the company at a special celebration. In 1997, she was awarded a U.S. Patent for a "Passive Intermodulation Shield" material for the antenna area of spacecraft.

Judy May and her husband retired from Hughes Space and Communications Company on the same day in 1998 and she currently enjoys spending time with her 9 grandchildren.

### **Karen (Foster) Gray**

Karen (Foster) Gray was the fifth Iowa Alpha recipient of the Tau Beta Pi Woman's Badge, graduating from Iowa State with a B.S. in Chemical Engineering in 1960. She recalls being honored and pleased to receive the Tau Beta Pi Woman's Badge when she was a student in Chemical Engineering.

She worked as a chemical engineer/physical chemist after graduation and when she and her husband started their family, she chose to stay at home and raise their children. Her husband, James A. Gray, was a fellow 1960 ISU Chemical Engineering graduate and he went on to receive a PhD degree in Chemical Engineering from Iowa

State in 1965. His employment by the Dow Corning Corporation took them to Midland, Michigan where they established their home. Her husband worked for Dow Corning for 35 years until his retirement, and she recalls that during this time she had very little to do with chemistry, per se, except for several years when she taught high school chemistry to adults desiring to work for the Dow Corning Corporation.

She and her husband have continued to live in Midland, Michigan, following his retirement. Karen Gary passed away on 25 July 2012.

### **Idelle (Johnson) Peterson**

Idelle (Johnson) Peterson was the sixth Iowa Alpha recipient of the Tau Beta Pi Woman's Badge, graduating from Iowa State with a B.S. in Chemical Engineering in 1960. While at ISU she was active in the student chapter of the American Institute of Chemical Engineers, holding a number of offices. She was also a member of the Iowa State Players throughout her years as an undergraduate, performing in yearly theater productions including "The Innocents", "I remember Mama", "The Importance of Being Earnest" and "The Lesson".

After graduation, she married Leonard Dean Peterson, a PhD student in Mathematics, and remained at Iowa State to pursue graduate studies, received a Master of Science degree in Chemical Engineering in 1964 and a PhD in 1968. Her research was done at the Ames Laboratory and involved the growth of gadolinium single crystals and the recrystallization of zinc.

Idelle's professional career included one year at the McDonnell Douglas Research Center in St. Louis and over 20 years with the U.S. Army in St Louis, working in aviation research and development.

Idelle has three children and since retiring has lived in Bourbon, Missouri.

### **Beverly (Birchmier) Audeh**

Beverly (Birchmier) Audeh was the seventh Iowa Alpha recipient of the Tau Beta Pi Woman's Badge. She was the first woman to graduate in Aerospace Engineering from Iowa State receiving her B.S degree in 1961.

As a student, she was always at the top of her class. Classmates recall an attempt to have her grades, which was generally well above everyone else, excluded in calculating the average score in her classes in order to make the scores of other students look better. The suggestion didn't fly, however.

Following graduation she spent a year studying in England on a Fulbright scholarship. Prior to returning to Iowa State to work on a Masters degree she and

Nadeem F. Audeh, a fellow student at Iowa State, were married in Lebanon, where she had the opportunity to meet his family.

Beverly completed her M.S. degree in Aerospace Engineering at Iowa State in 1963 and she and her husband move to Huntsville, Alabama. She was initially employed by the Heat Technology Laboratory, Inc. working on the turbulent mixing of concentric reacting jets and her husband joined the Electrical Engineering faculty at the University of Alabama, Huntsville. She subsequently was employed by Lockheed Martin as a Research Engineer at their Space Systems facility in Huntsville, Alabama.

Currently she is retired from the Lockheed Martin Corporation, and her husband is Professor Emeritus, Electrical and Computer Engineering at the University of Alabama, Huntsville.

### **Mardith Baenziger**

Mardith Baenziger was the eighth and final Iowa Alpha recipient of the Tau Beta Pi Woman's Badge. She received the Wonam's Badge in May 1968. She graduated from Iowa State with a B.S. in Architectural Engineering in 1968. She also received a Master of Science degree in Nuclear Engineering from Iowa State in 1969. She was initiated as a member of Iowa Alpha on 22 May 1971.

From 1970 to 1975 she worked as an engineer and project engineer for a consulting engineering firm in Akron, Ohio, mainly involved in commercial, institutional and light industrial structures. In 1976 she moved to Wisconsin to attend graduate school at the University of Wisconsin, Madison earning a Master of Science degree in Engineering Mechanics in 1978 and a PhD in Civil Engineering in 1981. While studying at the University of Wisconsin, she was also a teaching assistant and instructor. When she started work on her doctorate degree, her sons were 1 and 3 years of age and she commuted three hours to school each day, while continuing to do all of the normal work of a housewife, cooking, cleaning, laundry and child care.

After receiving her PhD, she returned to Iowa State University as an Assistant Professor in the Department of Civil Engineering in 1981. As a single parent with two sons she had the challenge of balancing her professional career with her private life. A measure of her success in this regard was the 1985 ISU Faculty Award she received for Excellence in Teaching, Research, and Service in Civil Engineering. In 1986 she was one of only three tenured women faculty members in the ISU College of Engineering, alongside 201 tenured men, with another ten women and 67 men working toward tenure in the college. At that time, civil engineering students were predominately men, over 90 percent, and therefore, the classes she taught were often comprised almost exclusively of men.

While a faculty member, her main areas of professional interest included structural dynamics and analysis, computer methods of analysis and design, computer



graphics and engineering education. She retired in 2007 as an Associate Professor, Structural Engineering, and continues to live in Ames.