

CHAPTER 23

E. Lee Allen, B.C.O.

(1910 – 2006)

Faculty 1937 - 1976

by Michael O. Hughes, B.C.O. and Bruce E. Spivey, M.D.



E. Lee Allen, B.C.O., 2000

“It is impossible to enumerate Lee Allen’s contributions to medical illustration, ophthalmic photography, ophthalmology.... He invented instruments, collaborated in developing ocular implants, and constantly worked to develop new methods for giving patients the best results. Whatever he did, Lee constantly strove for the perfect possible outcome.”

- Michael O. Hughes, et. al.

Journal of Ophthalmic Prosthetics

Edwin “Lee” Allen was a unique and significant auxiliary member of the Department of

Ophthalmology at the University of Iowa from 1937 to 1976.

Born in 1910 in Muscatine, Iowa, Edwin Lee Allen was the first child of Herman Clyde Allen and Loreda Robinson Allen. His father was a machinist who completed his education through a correspondence school. As a result of complications from the Spanish flu pandemic, his mother died in 1919 leaving two young children, Lee and his younger sister, Mary. His father remarried Bessie F. Berkholder in 1920.

Herman Allen became a successful design engineer for C.E. Erickson Advertising Novelty Company in Des Moines, Iowa. He wanted his son, Lee, to discontinue formal school after eighth grade, work full time, and finish his education through a correspondence school as he had done. With the encouragement of his stepmother, Lee worked his way through East High School in Des Moines, Iowa by delivering Western Union Telegrams. At age sixteen, Lee became interested in pursuing an art career. Although his father tried to discourage Lee, his stepmother and high school art instructor, Miss Harriet Macy, encouraged the young artist to seek his dream.

After high school graduation in 1928, Lee attended one full year at the Cumming School of Art in Des Moines. He then enrolled in the University of Iowa to study art in 1929.



E. Lee Allen

In 1928 and 1929, Lee entered some of his artistic work in competition at the Iowa State Fair. While attending the fair, he met Grant Wood, the famous artist from Cedar Rapids who is most noted for his painting *American Gothic*. Wood encouraged Lee and invited him to attend drawing classes. Lee also accompanied Wood to the Amana Colonies for sketching sessions.

C.S. O'Brien, M.D., Head of the Department of Ophthalmology at the University of Iowa, was forming the Department at this time. In 1929, he hired a freshly graduated art major from the University, E. Gustav Bethke, to be an ophthalmic artist for the department. Dr. O'Brien sent Bethke to the Department of Art as Applied to Medicine at Johns Hopkins in Baltimore, Maryland to study medical illustration under German artist Max Brödel. Bethke worked for Dr. O'Brien for one year. Some of his long, hard work had been entered in various shows. At a show in New York, Maynard C. Wheeler, M.D. was impressed with Bethke's work and encouraged him to accept a position as a medical illustrator at Columbia University College of Physicians and Surgeons. In 1930, Bethke accepted the position at Columbia and left Iowa.

Trying to find a replacement, Bethke asked Lee Allen, his roommate and two years younger, but Lee turned it down. Lee often accompanied Bethke to the hospital and learned how to make detailed ophthalmic drawings, but he still wanted to pursue a career as an artist. Bethke suggested Greg Hull to Dr. O'Brien as Hull had worked as an architect's assistant in Chicago. Hull was hired in 1930 and remained for three years. Gladys Larson replaced him and Lee Allen referred to Larson as "the best retina artist the University of Iowa ever had." She stayed until 1937.

During his years as a student at the University of Iowa, Lee worked at the New Idea Decorating Company. He also kept in close contact with Grant Wood and studied at his summer art camps. In 1933, upon his return from the Chicago World's Fair, Lee found a note from Grant Wood pinned to his door. Wood invited Lee to work with him for the Midwest District Works Progress Administration Art Project as a student supported by the government 'Student Relief' funds to paint murals.

Lee's mural designs had been selected through a competitive selection process by the United States Department of the Treasury funded Public Works of Art Project in 1934 for the decoration of two post offices in Iowa, Onawa and Emmetsburg. After studying with the prominent muralist Diego Rivera in Mexico during the summer of 1935, Lee returned to Iowa to paint the commissioned murals.



Post office mural in Onawa, Iowa painted by E. Lee Allen, 1935



Post office mural in Emmetsburg, Iowa painted by E. Lee Allen, 1935

In 1936, Lee married Mary Boyce. Their first daughter was on the way when Dr. O'Brien offered theophthalmic artist position to Lee again. He accepted to have a steady income for his young family.

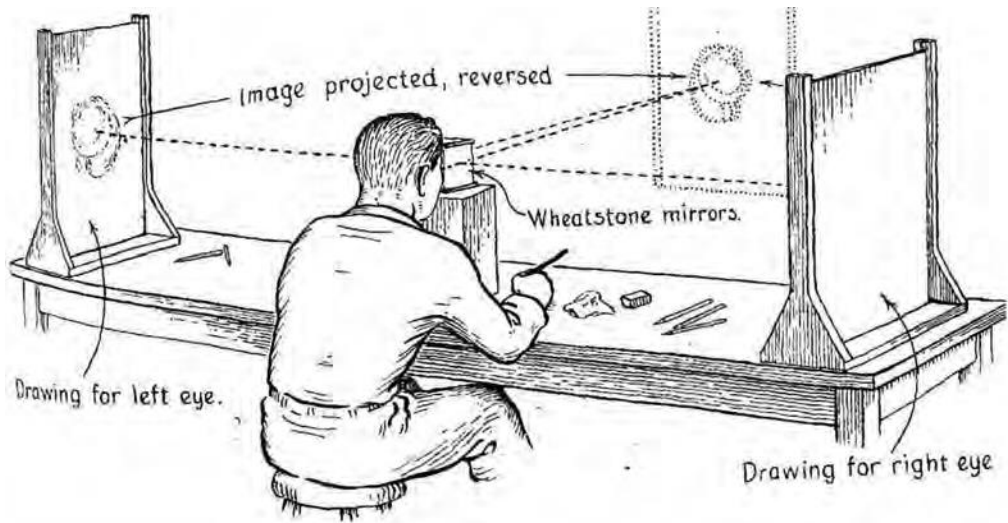
With the need to understand eye anatomy and diseases, Lee began self-education. He observed surgeries, attended lectures, discussed with surgeons, and audited classes.

His continuous efforts to help patients and his own curiosity directed Lee to his many innovations. With encouragement from the University photographer F.W. Kent, Lee developed an interest in stereopsis, which he applied through his illustrations and later through photography. Collaborating with P. J. Leinfelder, M.D. in 1940, Lee made a pair of drawings viewed with a Wheatstone stereoscope. When viewed through the stereoscope, the observer's brain could fuse the two images to appear three dimensional.

One of Lee's many talents was teaching his ideas through illustration. He even illustrated his own patent applications. His skill and talent kept his services in great demand within the University. Lee served as the President of the Association of Medical Illustrators in 1959.

In 1941, gonioscopy to study the anterior chamber angle was performed with a Barkan lens, a loupe, and a penlight. For optical continuity, a water chamber between the goniolens and the cornea was required, but the water leaked out within thirty seconds. Lee was able to duplicate the goniolens based on the description by James H. Allen, M.D. (no relation to Lee).

Lee believed this technique could be improved, and used skills he learned in his father's machine shop to design a small lens that only contacted the cornea and maintained optical continuity. With Dr. O'Brien's suggestion, Lee modified the goniolens by mounting it on a speculum to be positioned under the eyelids.



Lee Allen's illustration of viewing drawings with the Wheatstone stereoscope, "Stereoscopic drawing techniques," Medical and Biological Illustration, 1951



Allen-Thorpe Gonioprism



Hermann M. Burian, M.D. and his ERG assistant, Marie Carter inserting an ERG electrode designed by Lee Allen and made by Ken Hansen, 1954

Harvey Thorpe, M.D., an ophthalmologist at Montefiore Hospital in Pittsburgh, collaborated with Lee to develop a four mirrored lens named the Allen-Thorpe Gonioprism that allowed examinations with a slit lamp. This lens enabled Lee to make new observations and medical illustrations of the anterior chamber angle.

Hermann M. Burian, M.D. performed electrophysiological studies of the eye in the Department. He collaborated with Lee in designing a better contact lens electrode for electroretinography (ERG) that would create more reliable testing results. Lee's modifications proved satisfactory, and Ken Hansen, a skilled optician, began producing the Burian-Allen ERG electrodes in 1954, which were used worldwide.



*Kenneth H. Hansen,
Optician*

In 1939, Lee established ophthalmic photography as an essential part of the Department of Ophthalmology. He modified a simple 35mm camera to mount on an extension with the new Kodachrome film that could take close-up photographs of the anterior segment and external eye. Lee used this modified photography system to document the flow of fluorescein dye in the anterior chamber. He also revived a fundus camera purchased by Dr. O'Brien and modified it to take color photos of the retina and anterior segment.

Ogden Frazier, a skilled machinist and toolmaker, was hired by the Department in 1964 to assist in photography and new instrumentation production as the photography services expanded.

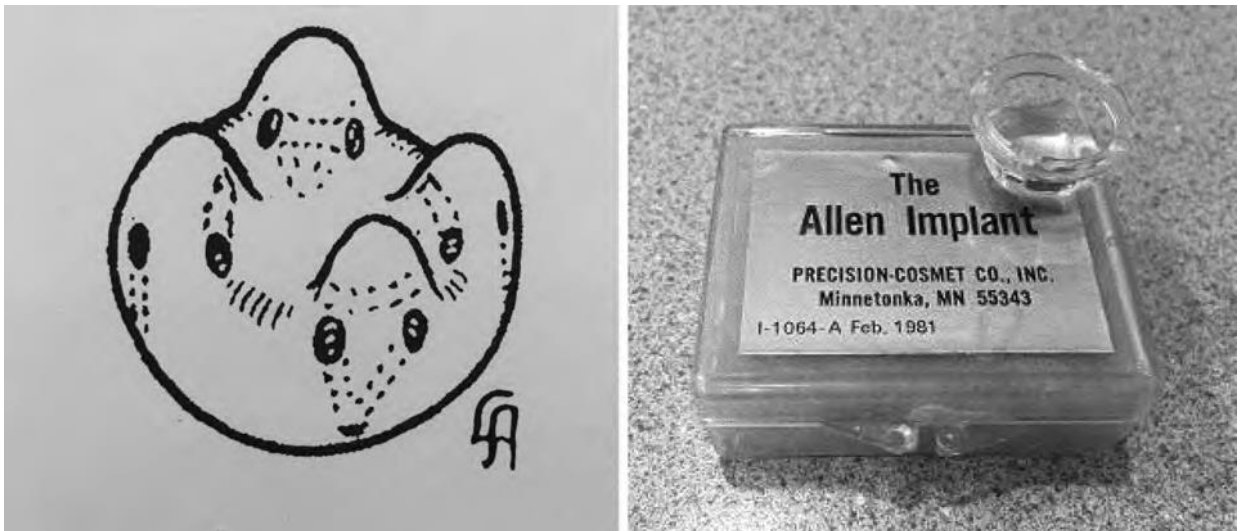


Stereophotography, Lee Allen, 1974

Applying his expertise in three dimensional stereoscopic drawings, Lee developed photography techniques to produce effective stereo photographs. These techniques were modified, and the Allen Stereo Separator produced by Zeiss Optical Company in 1970 made it possible to take stereo fluorescein angiograms. He also installed beam splitters on the slit lamp camera to obtain stereo slit lamp photographs. The development of ophthalmic photography by Lee and Ogden set the standards of the emerging profession.

In 1969, photographers working in ophthalmology gathered and formed the Ophthalmic Photographers' Society. Organizer, Johnny Justice, Jr., suggested that the first president of the organization should be the internationally recognized pioneer in ophthalmic photography, Lee Allen.

Early 'glass eyes' (artificial eyes) were mouth-blown, hollow glass stock shapes. Many were imported from Germany. These eyes had problems including fitting difficulties, infection complications, and fragility. With the development of acrylic, early plastic artificial eyes were first created in 1937 by Fritz Jardon, a dental technician from Kansas City. Dr. James Allen, still a professor at the University of Iowa and serving as a Major at Scott Air Force Base in Illinois, felt that ocular prostheses could be perfected. Lee was sent to the Dental Laboratory at Scott Air Force Base to learn basic techniques of handling dental waxes and mold making plasters. He returned to Iowa and the Department of Ophthalmology to perfect the acrylic prostheses for a growing clientele of monocular patients hungry for better prosthetic eyes.



Schematic and Allen Implant



Iowa Implant



*Lee Allen and Howard Webster,
ocularists making and fitting
ocular prosthesis, 1958*

Years later, in 1948, Dr. Allen and Lee collaborated and developed an ocular motility implant, the “Allen Implant.” This implant, although provided motility, had many complications.

In 1957, Lee created the ocular implant, the “Iowa Implant,” that was completely buried under Tenon’s capsule and conjunctiva. The Iowa Implant was a quasi-integrated ocular motility implant that utilized four mounds coupled with the impression-fit ocular prosthesis.

Lee began making and fitting prosthetic eyes for the Department of Ophthalmology in the late 1940s. With the overview from Dr. Blodi, in 1968, Lee established a formal ocularist apprenticeship training program at the University. He was a charter member of the American Society of Ocularists and served as President of the Society in 1969. Lee taught workshops, lectured, published, and helped establish the National Examining Board of Ocularists. Lee’s article published in 1969 in the American Journal of Ophthalmology, “Modified Impression Methods of Plastic Eye Fitting,” is considered the standard for ocularists.

After forty years in the Department of Ophthalmology, Lee retired in 1976. In private practice with David M. Bulgarelli, B.C.O., he continued to fashion custom prosthetic eyes and ocular implants in Iowa City. Eventually, Lee returned to fine arts painting. He continued to be an emeritus part of the Department by assisting faculty with publications.

In 1988, Lee was developing macular degeneration at the age of 78. In 2000, he authored and illustrated his own book, *The Hole in My Vision*, to depict the visual changes he experienced as the disease progressed.

The American Academy of Ophthalmology awarded Lee Allen the Senior Honor Award in 1984 and the Outstanding Lifetime Achievement Award in 2001.

Lee Allen died in 2006. He ambitiously applied his artistry, skills, and expertise to the work he did throughout his career. As a result, he helped patients around the world.

THE Hole In My Vision

An Artist's View of
His Own Macular Degeneration

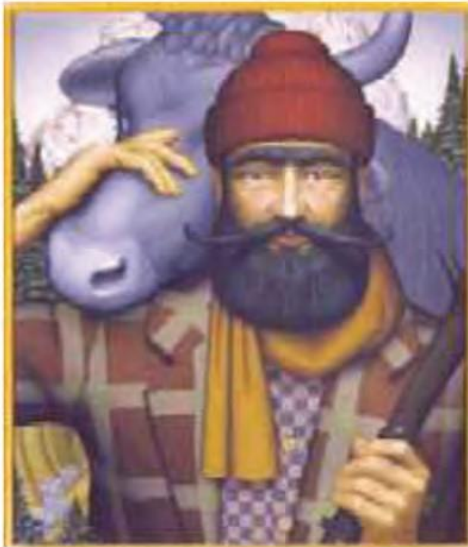


Lee Allen



The Old Iowa Capitol Building, Iowa City, flag at half-mast to honor Lee Allen, 2006

Paintings by Lee Allen



Paul Bunyan and the Blue Ox,
1947 (Gift of Dr. Clarence Van
Epps, University of Iowa Stanley
Museum of Art)



Wayfarer, 1988 (owner H.E. Kolder)



Lazy Autumn Day, 1988 (owner M. Leinen)



Requiem for a Family Farm, 1
Requiem for a Family Farm, 1989 (owner R.
Anderson)

