

## MEMORIAL RESOLUTION

### F. BLAIR SIMMONS

(1930 - 1998)

Professor Francis Blair Simmons died on February 13, 1998 of a heart attack while skiing at Heavenly Valley. He was 67 and spent more than 36 years on the Stanford faculty. He is survived by his wife, Shirley, of Portola Valley; 4 children, Kathryn Hickinbotham of London, Holly Parnigoni of Charlestown, Rhode Island, Kevin Simmons of Los Angeles and Iris Coshow of Santa Rosa; 4 stepchildren, Curtis Stevens of Portland, Oregon, Jeffrey Stevens of Maui, David Stevens of San Diego and Kerry O'Brien of Portland; and 11 grandchildren.

Blair was born in Los Angeles on November 15, 1930. How early in his life he discarded Francis and became "Blair" is not known with certainty, but all his family members and friends have called him Blair as long as they can remember. He received his AB cum laude from the Transylvania College in Lexington, Kentucky in 1952. During medical school at the University of Louisville, he successfully competed for a Public Health Service Medical Student Fellowship under Dr. S. M. Walker and the following year became a research associate at the Harvard Psychoacoustic Laboratory working with Dr. S. S. Stevens.

Following his internship at Madigan Army Hospital in Tacoma, Washington, he became a research associate under Dr. Robert Galambos at the Walter Reed Institute of Research, Neurophysiology and Auditory Physiology Laboratory. This proved to be a fruitful association and shaped much of his subsequent research career. While doing his residency at Stanford from 1959 to 1962, he continued his studies on the middle ear muscle acoustic reflexes in the cat and managed to publish 10 articles, most in prestigious journals such as Science and the Journal of the Acoustical Society of America.

At the completion of his residency, Blair became an Assistant Professor in Surgery (Otolaryngology), a position that he held for 3 years until 1965 when he became Associate Professor and Head of the Division.

Less than a month after assuming his faculty position, Blair seized a clinical opportunity that was to profoundly shape his next 30 years of research that ultimately led to a substantial contribution to clinical medicine. On July 26, 1962, he was the first person in the United States to perform direct auditory nerve stimulation on a human subject. The subject was an 18 year old male who had previously undergone a right hemispherectomy for an ependymoma. He had a 2 year history of a gradually increasing hearing loss on the right side. His hearing test showed an asymmetrical hearing loss, worse on the right, with bilateral high frequency neurosensory hearing loss. On the day before his surgery, he was given a 3-hour auditory training session where he learned how to describe his perceptions with considerably better precision than beforehand. The patient underwent a repeat posterior craniotomy under local anesthesia without pre-medication. A minimal amount of recurrent tumor was found and partially removed before exposure of the 4th ventricle and 8th nerve complex. A 1 cm segment of the nerve was isolated and a bipolar electrode with a tip separation of about 3 mm was placed on the nerve. The detail in which he reported his results published in 1964 epitomized all of his research.

Twenty two months later, he performed the first permanent implantation of 6 electrodes into a 60 year old man with retinitis pigmentosa with a total hearing loss in his right ear and a profound neurosensory hearing loss in the left ear. The 30 publish-paged "case report" concluded "if these studies prove encouraging, and if the considerable technical difficulties of long-term discrete stimulation of the auditory nerve can be resolved, an artificial end organ may be possible." For the next 25 years, he dedicated much of his life to developing "the bionic ear". Two other laboratories in California, one at UC San Francisco and the other at the House Group in Los Angeles also began human experimentation with cochlear implants following Blair's work. Extravagant claims for implants were made both at scientific meetings and in the newspapers; speech was said to be understood and some patients were said to be able to converse over the telephone.

Although Blair readily agreed that skepticism engendered by claimed miracles was healthy, he was dismayed about the outright denial that a genuine research problem existed. He had much difficulty trying to find a team who would risk "tainting" their scientific careers. Fortunately, in 1971, Blair teamed up with Dr. Robert L. White and 2 graduate students in electrical engineering to develop a cochlear prosthesis system. While others were implanting humans, Blair and his team which also included Ted

Glatke, Laurel Dent and others worked on numerous hardware variations on the prosthesis itself to determine its long-term biocompatibility.

Blair recognized early in the 1960's that the major task facing further implant development was to design and fabricate a multi-channel portable speech processor. Meanwhile, he and his team made several important contributions in the area of speech processing.

Three other substantial contributions to the field of Otolaryngology deserve a note: continued clinical research and development of electronystagmography, a clinical test of vestibular function; development of a newborn hearing screening device known as the Crib-o-Gram; and teaming up with professors Christian Guilleminault and William Dement, Blair made important contributions to the surgical management of patients with obstructive sleep apnea. The Crib-o-Gram deserves special mention in view of its simplicity and creativity. A normal reflex phenomenon in newborns is what is called the "startle reflex". When a newborn hears a loud noise, it is startled and produces movement. Blair exploited this phenomenon by placing a motion sensor in newborn baby cribs and periodically in the quiet of the night would introduce 92dB narrow band (2-4kHz) noise. Thus, all newborns could have their "hearing" tested by this simple maneuver. The second important concept was that the earlier newborns were identified with a hearing loss, the sooner remedial training could be instituted that would result in better speech recognition and speech development. Controversial at the time was the concept of testing every newborn because it added \$1.50 to the newborn's hospital bill. This test was the first inexpensive fully automated procedure that could be instituted in any hospital. He was granted a patent on the Crib-o-Gram device which generated a modest amount of money for Stanford and himself. The money was totally unimportant for him, but his passion for helping the hearing impaired was relentless. After testing over 12,000 newborns, he concluded it was economically justified to test only those newborns in the intensive care nursery where the incidence of hearing loss was found to be 1 of 52 graduates of the nursery.

He had a particular genius for being able to sort through complex paragraphs of a research protocol and restate the information in a single question statement. He was a mentor to both of us and many other faculty members, residents, and medical students as well. Several of his residents became chairpersons of departments of Otolaryngology-Head & Neck Surgery at other universities, and many have become

leaders in academic Otolaryngology-Head & Neck Surgery as well. He taught a rather simple methodology: ask a question, carefully design the methodology to answer the question, “critically evaluate the data, critically evaluate the data, critically evaluate the data”. Publish the results no matter what the outcome, and never be afraid to challenge conventional wisdom. There was no question in anybody’s mind that he was one of the most intelligent people in our field, both nationally and internationally. He published over 140 papers, 16 book chapters, and 2 books. Among the many awards that he received, the most notable were election to the Collegium ORL Amicitiae Sanctum and the American Otological Society where in 1997 he received its highest award, “The Award of Merit”. In 1984 he was the first Stanford recipient of a 7 year, 1.8 million dollar Javits Neuroscience Investigator Award from the NIH.

On a personal note, he was an avid tennis player and did not like to lose. On the other hand, if he ever thought that you were allowing him to win, he would never play with you again and would not hold you in high respect. He was an avid kayaker and relished white water rafting. He loved the outdoors, and it is perhaps fitting that his last day was spent at Heavenly Valley, skiing in the company of his beloved wife, Shirley, with whom he enjoyed a wonderful 21 year marriage. His family doubled in size with that union and he thoroughly enjoyed being a father to eight children, their partners, and his 11 grandchildren. His life was very full and satisfying, but much too short.

Presented to the Senate of the Academic Council on April 30, 1998

W. E. Fee, Jr., Chair  
Richard L. Goode