

ASA past President and Gold Medal recipient Floyd Dunn, a groundbreaking pioneer in the science of ultrasound and bioacoustics, died on January 24, 2015. A veteran of the WWII Battle of the Ardennes, he was 90 years old. His death comes 30 days after that of his wife of 64 years, Elsa Dunn.

Floyd attended the University of Illinois at Urbana-Champaign in the Department of Electrical Engineering. He earned three degrees, including his PhD in 1956. For more than 20 years, he directed the Bioacoustics Research Laboratory that had been founded by his research advisor William J. Fry in 1946. Floyd chaired the bioengineering faculty from 1978 to 1982. He retired and accepted emeritus status in 1995. In 1996, he and Elsa moved to Tucson, Arizona, where Floyd remained scientifically active.

Floyd had an extraordinarily creative science and engineering career at the interface between diagnostic and therapeutic ultrasound and living systems, and his influential research significantly promoted diagnostic and therapeutic ultrasound. He was the first to quantify *in vivo* the temperature-dependent ultrasonic absorption coefficient (Dunn, 1962), a pivotal finding that significantly influenced therapeutic ultrasound; the first to demonstrate that ultrasonic images resulted from structural protein constituents (Fields and Dunn, 1973), a seminal finding that initiated worldwide research activities in ultrasonic tissue characterization; and the first to recognize the need to quantify the nonlinearity parameter in biological materials (Law et al., 1981). His innovative experimental preparations showed that physical interactions of ultrasound in living systems occur under conditions where thermal and cavitation events were innocuous (Hawley and Dunn, 1964), thus demonstrating the control achievable in producing reversible and irreversible changes in living systems. Floyd's revolutionary work contributed to the safety and efficacy of diagnostic and therapeutic ultrasound. This included determining ultrasonic thresholds for irreversible structural changes (Dunn, 1957; Dunn and Fry, 1971). These thresholds became the *de facto* worldwide standards from which government, academic, and research bodies established diagnostic ultrasound safety criteria.

Floyd was a member of both the National Academy of Sciences and the National Academy of Engineering. He held fellowships in seven professional associations and was a member of eight editorial boards. He was a recipient of the IEEE Edison Medal and the American Institute of Ultrasound in Medicine (AIUM) William J. Fry Memorial Lecture and Jo-



*Left: Floyd in Belgium around Thanksgiving 1944 during WWII. Right: Floyd wearing his National Academy of Engineering tie.*

seph P. Holmes Basic Science Pioneer Awards. He received the University of Illinois Senior Scholar and Distinguished Alumnus Awards and the Medal of Special Merit of the Acoustical Society of Japan and was an honorary member of the Japan Society for Ultrasound in Medicine.

For sustained leadership in biomedical ultrasound, Floyd Dunn stood alone. Devoting his career efforts to the subject for nearly six decades, he maintained a steady flow of productive research and built one of the largest organizations devoted to the field. Through leadership and participation in numerous organizations behind the scenes, he encouraged the development of the field at home and abroad.

Floyd was involved in the first major blossoming of biomedical ultrasound in the 1950s and 1960s including a few years when he nearly single handedly kept the field alive. Today, biomedical ultrasound is a major industry and basic research receives a significant fraction from NIH. No single scientist is more responsible for this success than Floyd Dunn.

Floyd and Elsa Dunn are survived by their daughter, Andi Dunn, their son, Roo Dunn, and five grandchildren.

*Written by:*

**Andi Dunn**, Oak Park, Illinois

**Roo Dunn**, Bath, Maine

**Bill OBrien**

*Director, Bioacoustics Research Laboratory*

*Department of Electrical and Computer Engineering*

*University of Illinois at Urbana-Champaign*

*Urbana, Illinois 61801*

*wdo@uiuc.edu*