Acoustical Society of America 1986 awards

The Acoustical Society of America last year honored seven individuals for their work in acoustics.

James L. Flanagan (AT&T Bell Laboratories, Murray Hill, New Jersey) received the Gold Medal for his "contributions to and leadership in digital speech communications." Flanagan received his undergraduate degree in electrical engineering from Mississippi State University (1948), and his MS (1950) and ScD (1955) from the Massachusetts Institute of Technology. He was an electronics scientist at the Air Force Cambridge Research Center (1955–57) before becoming a member of the technical staff at Bell Labs in 1957. In 1961 he became head of the speech and auditory research department, in 1967 head of acoustics, and in 1985 director of the Bell Labs Information Principles Research Laboratory. In research on digital transmission of speech, Flanagan and his collaborators devised coder–decoder techniques for transmitting speech at information rates of 4.8–32 kbits per second. They established adaptive waveform coders that automatically adjust to the speech signal they encode, and which provide a basis for adaptive coders now widely used in telecommunications systems. In addition, Flanagan developed comprehensive computer models of auditory signal processing and the physics of speech production. Flanagan has served ASA as president (1978–79), vice president (1976–77) and associate editor of the *Journal of the Acoustical Society of America* (1959–62), and he was a member of the AIP board of governors from 1974 to 1977. He is the author of a fundamental text, *Speech Analysis Synthesis and Perception* (Springer-Verlag, 1972).

John G. Backus (University of Southern California) received the Silver Medal in Musical Acoustics for his "pioneering research on the acoustics of woodwind and brass instruments, and for bridging the gap between acousticians and musicians." Backus received his undergraduate degree from Reed College (Portland, Oregon) in 1932. He pursued his graduate studies at Purdue and at the Unviersity of California in Berkeley, receiving his PhD at the latter, under E. O. Lawrence, in 1940. He remained at Lawrence's Radiation Laboratory as a research physicist during World War II working on the mass spectrometer isotope separation of U^{235}. In 1945 he became an associate professor of physics at the University of Southern California; he was made a full professor there in 1965. His initial studies at Southern California were of gaseous discharges in strong magnetic fields, but he subsequently began working in the acoustics of reed and brass musical instruments. He published fundamental data on the nonlinear flow control properties of woodwind reeds (1962) and improved the capillary method for determining the input impedance of air columns (1975); he has worked on developing synthetic reeds for woodwinds throughout his career. Backus demonstrated that vibrations in the walls of woodwind instruments and, more recently, resonances in the player's vocal tract have little or no effect on the tone produced. Backus retired from teaching in 1978, but he has continued his research program, in particular on the physics of the bassoon. He has written *The Acoustical Foundations of Music* (Norton, 1977).

Tony F. W. Embleton (National Research Council, Canada) received the Silver Medal in Noise for his "fundamental contributions to the theory and practice of noise control, and for international and national leadership in acoustics." Embleton received his BSc (1950), his PhD in physics (1952) and a DSc (1964) from the University of London. He went to NRC in 1952 on a postdoctoral fellowship, and joined the

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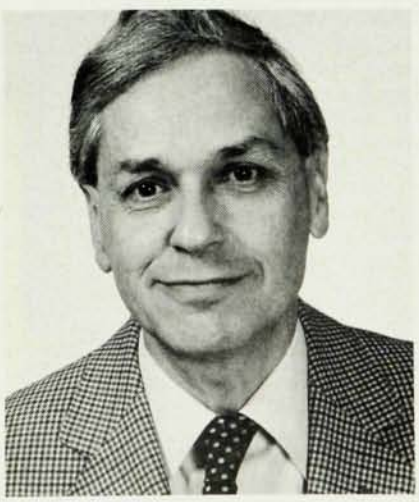

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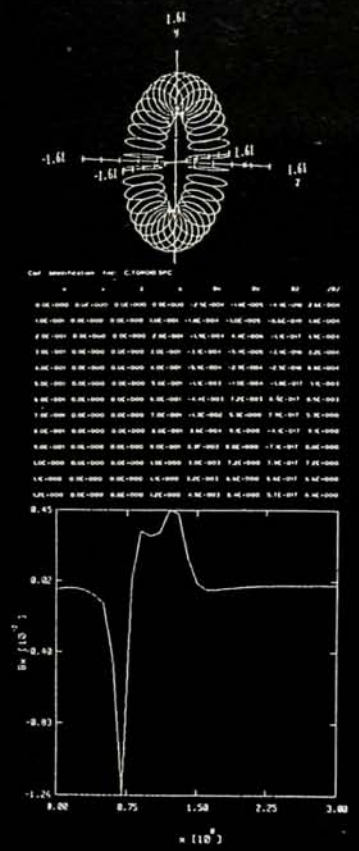

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physics division in 1954 as an associate research officer, becoming a senior research officer in 1962, and principal research officer in 1974. In 1985 he became head of the acoustics section. In the early 1950s he and George Thiessen (NRC) devised a means of reducing the noise produced by large suction rolls in Canada's paper mills by 12 to 20 dB, through the substitution of specially designed patterns of holes for the regular arrays in use at the time. Embleton applied similar principles in his later studies of noise reduction in centrifugal blowers and, with Thiessen, of axial-flow compressors. Embleton worked on criteria for noise levels in offices, and he improved, in the 1960s, the reciprocity system for making absolute measurements of sound pressure. More recently he has been involved in extensive studies on outdoor propagation of noise. He was founding editor-in-chief of *Acoustics and Noise Control in Canada* (1972–75), and he served ASA as a member (1962–85) and chairman (1964–67) of the technical committee on noise, and as vice president, acting president and chairman of the technical council (1977–78). Embleton was president of ASA from 1980 to 1981 and chairman of American National Standards Institute S1 committee on acoustics from 1982 to 1985.

Albert G. Bodine (Bodine Soundrive, Van Nuys, California) received the Silver Medal in Engineering Acoustics for "his ingenuity in developing sonic and vibratory devices of great technological importance." Bodine was educated at the University of California at Los Angeles and Caltech. After working at American Liquid Gas as chief engineer (1947) and at Hughes Aircraft as project manager of aircraft fuel pump and carburetion (1948), he founded Bodine Soundrive. He later founded Soundrive Engine (1949), Soundrill (1950) and Soundrive Pump (1952). Bodine has used sound or vibration in a wide variety of engineering applications and designs: He has developed a pulse jet system (1940); a siren that produces 100 kW of acoustic power with an efficiency of about 40% for studies of sound damage caused by jet engines on airplanes (1949); several systems that use sonic vibrations for rock crushing, leaching of minerals, pile driving, drilling and pumping deep oil wells, and for removing the liners from deep wells; a sonic powdered coal combuster, and acoustic absorbers to control screech in rocket motors and jet engine afterburners, and controlled detonation in piston engines.

William E. Cooper (University of Iowa) received the Biennial Award for his "exploration of the mechanisms for processing the phonetic attributes of speech, for his pioneering research in the role of prosody and intonation in sentence processing and sentence planning, and for his contributions to basic research on speech and language disorders subsequent to brain damage." Cooper received a BA in linguistics and psychology and an MA in psycholinguistics from Brown Unviersity in 1973. He received his PhD in psychology from MIT in 1976, and remained there as a postdoc until 1978. He became an assistant professor of psychology at Harvard University in 1978, and an associate professor of psychology in 1981. In 1983 he became a professor of psychology at the University of Iowa. Cooper has studied many aspects of speech perception: the role of the acoustic features of speech signals and the listener's sensitivity to small acoustic changes, intonation and prosody in sentence structure and planning, and potential phonetic bases of metrical phonology. In addition, he has studied speech and language disorders in individuals who have sustained brain damage.