



Jozef J. Zwislocki was born on March 19, 1922, in Lwow, Poland, and passed away on May 14, 2018, in Fayetteville, NY. He was a Distinguished Professor Emeritus of Neuroscience at Syracuse University, Syracuse, NY, a fellow of the Acoustical Society of America (ASA), and a member of the United States National

Academy of Sciences and the Polish Academy of Sciences. His large list of awards includes the first Békésy Medal from the ASA and the Award of Merit from the Association for Research in Otolaryngology. Zwislocki's wide-ranging career focused on an integrative approach involving engineering, psychophysics, neurophysiology, education, and invention to advance our understanding of the auditory system and the brain. His early years were shaped by the events of World War II (his grandfather, Ignacy Mościcki, was the President of Poland from 1926 to 1939).

In 1948, Zwislocki emerged on the scientific scene with his doctoral dissertation "Theory of Cochlear Mechanics: Qualitative and Quantitative Analysis" at the Federal Institute of Technology, in Zurich, Switzerland. The dissertation provided the first mathematical explanation for cochlear traveling waves. Recognition for this work led to positions at the University of Basel, Switzerland, and Harvard University, Cambridge, MA. In 1958, Zwislocki moved to Syracuse University. There, in 1973, he founded the Institute for Sensory Research (ISR), a research center dedicated to the discovery and application of knowledge of the sensory systems and to the education of a new class of brain scientists who integrate the engineering and life sciences.

Throughout his career, Zwislocki refined his theory of cochlear mechanics, modifying his model as new data became available and performing his own physiological experiments to test novel hypotheses. His contributions spanned the revolution in our understanding of cochlear mechanics, going from the passive broadly tuned cochlea observed by von Békésy in dead cochleas to the active sharply tuned response now known to be present in healthy cochleas, including the role of the tectorial membrane and outer hair cells in cochlear frequency selectivity. His psychophysical studies included

scaling of sensory magnitudes, both for the auditory system and other sensory systems; forward masking; just-noticeable differences in sound intensity; central masking; and temporal summation.

Zwislocki searched for global interrelationships among psychophysical characteristics such as loudness, masking, and differential sensitivity, and their relationship to underlying neurophysiological mechanisms. He advanced our knowledge of middle ear dynamics, using modeling and measurements, and developing new instrumentation as required to improve our understanding of middle ear sound transmission and the effects of pathology. He performed studies of the stapedius muscle reflex both for its own sake and to analyze what this reflex implied about processing in the central nervous system. His work resulted in more than 200 peer-reviewed publications and numerous inventions, including the "Zwislocki coupler." In his later years, he developed the Zwislocki ear muffler (ZEM), a passive acoustic device that he anticipated would significantly reduce noise-induced hearing loss.

Zwislocki loved skiing, sailing, trout fishing, horseback riding, and, of course, his wife of 25 years, Marie Zwislocki, who survives him.

Selected Articles by Jozef J. Zwislocki

- Zwislocki, J. J. (1960). Theory of temporal auditory summation. *The Journal of the Acoustical Society of America* 32, 1046-1060.
- Zwislocki, J. J. (2002). *Auditory Sound Transmission; An Autobiographical Perspective*. L. Erlbaum Associates, Mahwah, NJ.
- Zwislocki, J. J. (2009) *Sensory Neuroscience: Four Laws of Psychophysics*. Springer US, New York, NY.
- Zwislocki, J. J., and Goodman, D. A. (1980). Absolute scaling of sensory magnitudes: A validation. *Perception & Psychophysics* 28, 28-38.
- Zwislocki, J. J., and Jordan, H. M. (1980). On the relations between intensity JNDs, loudness, and neural noise. *The Journal of the Acoustical Society of America* 79, 772-780.
- Zwislocki, J. J., and Kletsy, E. J. (1979). Tectorial membrane: A possible effect on frequency analysis in the cochlea. *Science* 204, 638-639.

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