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Dr. Donald Henderson 1938-2017

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Dr. Donald Henderson passed away February 1, 2017, in the company of his family, his wife Terri and three children Dana, Aaron and Lee. Dr. Henderson moved to the University at Buffalo in 1987 where he served as Professor and Chair of the Department of Communicative Disorders and Science and he co-founded the Center for Hearing & Deafness and established a strong research program at UB that focused on noise-induced hearing loss. Dr. Henderson was an excellent teacher, trained many MS and Ph.D. students and published more than 200 scholarly papers, chapters and books. He organized more than a dozen international conferences in the US, Canada, Europe and Asia. In 2010, Dr. Henderson retired from the University at Buffalo. Don will be remembered as someone full of life and vigor; his glass of wine was always half full, reflecting his enduring optimism for life. He will be dearly missed by all of us who had the good fortune to known him.

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Richard Salvi, PhD

On April 20, 2012, the Department of Communicative Disorders and Science and the Center for Hearing and Deafness hosted a one-day Noise-Induced Hearing Loss colloquium to honour Dr. Donald Henderson's numerous contributions to audiology, hearing science, noise-induced hearing loss, otoprotection, and ototoxicity during his 45-year academic and research career. Permission has been granted from the *Canadian Hearing Report* to reprint this overview of Don's life and accomplishments.

Dr. Donald Henderson – Canada's Research Maestro of Noise-Induced Hearing Loss and Otoprotection

Don and his crown.

Don was a prolific scientific contributor and author, outstanding teacher and mentor, skilled administrator and he was well known for organizing many high profile international conferences on “hot topics” in the field.

Don was born in Hamilton, Ontario, Canada on October 3, 1938. After graduating from high school, Don attended college at Western Washington State College in Bellingham, WA where he majored in psychology. Unknown to most of his colleagues, Henderson was recruited to Western Washington State on a football scholarship and, more importantly, played professional football for one season with the BC Lions of the Canadian football league. Having found professional football too easy, Henderson decided to pursue an academic career and in 1962 entered the PhD program in sensory psychology at the University of Texas at Austin. After completing his PhD in 1966, Henderson spent two years as a post-doctoral fellow at the prestigious Central Institute for the Deaf in St. Louis, MO where he developed an interest in auditory evoked potentials and noise-induced hearing loss. In 1968, he was appointed assistant professor at the State University of New York Upstate Medical Center in Syracuse, NY. Anticipating the digital revolution, Henderson purchased the first university laboratory computer, a DEC PDP8 with an “unbelievable” 4k of core memory and a teletype and tape reader for output and input. Using this advanced computer hardware and special amplifier, he was one of the early pioneers to assess auditory evoked potentials from humans and primates and to record single neuron discharge patterns from the auditory brainstem, techniques considered cutting edge at this time. In the early 1970s, Henderson teamed up with Dr. Roger Hamernik, a mechanical engineer who had been using a shock tube to study shock waves produced by supersonic aircraft. Henderson, recognizing that blast wave exposure was a major cause of hearing loss among soldiers serving in Vietnam, convinced Hamernik to use his novel shock tube to study blast wave induced hearing loss in animal models. Working together, they published dozens of seminal papers documenting the relationship between the characteristics of the

blast wave and the degree of hearing impairment and cochlear pathology. These studies highlighted the importance of peak pressure, spectrum and repetition rate in causing hearing loss. For example, at very high intensities, the blast literally ripped the cochlea apart while at lower intensities metabolic exhaustion played a significant role in hearing loss. Unexpectedly, the addition of moderate intensity background noise during a blast wave exposure was found to significantly exacerbate hearing loss and cochlear pathology. These findings cast doubt on universal application of the equal energy hypothesis to predict noise-induced hearing loss. These studies, along with others, helped guide the development of federal noise regulations.

During his tenure at the Upstate Medical Center, Henderson rapidly advanced to the rank of full professor. In 1980, he moved his research team to the University of Texas at Dallas where he was promoted to the director of the Callier Center. He also served briefly as the acting dean of the School of Human Development. In 1987, Henderson moved to the University of Buffalo (UB) and assumed the position of professor and chair in the Department of Communicative Disorders and Sciences. A few years after arriving at UB, he co-founded the Center for Hearing and Deafness, a multidisciplinary research group that included scientists and clinicians from a wide range of schools, departments and scientific disciplines.

International Conferences

In 1975, Henderson organized the first in a long series of international conferences on noise-induced hearing loss, ototoxicity and acquired hearing loss. The proceedings of the first noise conference held at Cazenovia College were published in 1976 by Raven Press. This was followed by international noise conferences in Syracuse, USA, Beaune, France, Gothenburg, Sweden, Trento, Barga and Bari, Italy, Cambridge, England, and Niagara Falls, Canada. Henderson was also responsible for organizing international conferences on auditory plasticity, hair cell regeneration, tinnitus, immunologic diseases of the middle ear, central auditory processing, education of the hearing impaired, and ototoxicity. These conferences, which were scientifically stimulating, brought together leading scientists, administrators and clinicians from around the world in pleasant surroundings that fostered the exchange of ideas and new collaborations. For connoisseurs of elegant dining, the gala banquet in the heart of the wine cellars of Beaune will long be remembered as one of the best social and scientific events of the 20th century. A major accomplishment of these meetings was the compilation of 11 scholarly, widely read, state of the art books, some which are considered classics in the field of noise-induced hearing loss.

Scholarship

Over the course of his distinguished career, Henderson authored more than 130 scientific papers published in prestigious journals, 43 book chapters and 11 edited monographs. Henderson has given more than 300 scientific presentations at national meetings, international conferences or university colloquia. Over the course of his academic career, Henderson was able to secure continuous and substantial extramural grant support from numerous federal, state and private agencies including NIH, NIOSH, NIEHS, U.S. Army, NATO NOHR and DRF. Henderson often served as a consultant, reviewer, and advisor to many federal and state agencies. He served on numerous prestigious national and international committees including the National Institute of Occupation and Health (NIOSH), National Institute of Deafness and Other Communication Disorders (NIOSH) and Committee on Hearing and Bioacoustics (CHABA). Henderson was an associate editor for noise and health and the *Archives of Complex Environmental Studies* and was also a frequent reviewer for leading journals in audiology, hearing science and neuroscience such as *Ear and Hearing, Hearing Research, Nature Medicine, Journal of the Acoustical Society of America, and Neuroscience* to name a few. In recognition of his many accomplishments,

Henderson received the National Research Award in 2006 from Hofstra University for distinguished contributions to the field of research in hearing science. In the same year, he received the Outstanding Hearing Conservationist Award from the National Hearing Conservation Association. Henderson was also granted two patents related to the development of drugs to prevent noise and drug induced hearing loss.

Mentorship

In addition to collaborating with many prominent scientists in the field, Don has also mentored numerous MS, AuD, and PhD students in audiology and psychology. Henderson has a special gift for teaching and making anatomy, physiology, acoustics, clinical pathology and audiology sound easy, interesting and relevant in such courses as Advanced Hearing Science; Anatomy and Physiology of the Auditory System, Industrial Audiology, Introductory Psychology, Medical Audiology, Neural Basis of Communication Disorders, Physiological Psychology and Sensory Psychology. Over the years, he attracted many bright, highly motivated students who worked on research projects in his lab. Although he is best known for his work on noise induced hearing loss, his research interests spanned a broad range of topics including ototoxicity, evoked potentials, acoustic reflexes, cochlea anatomy, ototoxicity and age-related hearing loss. Several of his PhD students, including me, have gone on to hold faculty positions at major universities such as Ohio State University, SUNY Geneseo, West Virginia University, University at Buffalo and Medical University of South Carolina. His last PhD student, Dr. Chiemi Tanaka is a post-doc at Oregon Health Sciences University Hearing loss is a major problem for the armed forces and Don was responsible for training and mentoring 4 PhD audiologists who returned to military duty after completing their academic training. Don’s intellectual and scientific achievements will continue to influence our understanding of hearing loss acquired from noise, aging and ototoxic drugs for many years and many of his former students will continue the scholarly work that Don started more than 45 years ago.

Active and Thoughtful

Ask him about the latest novels or economic, political, sports and social events and Don will immediately offer an “earful” of thoughtful, provocative and engaging commentary about the world around us. His quick wit, smile and active mind will immediately capture your interest and imagination. Don and his wife, Terri, love to travel, enjoy meeting new people, tasting new cuisines, exploring big cities, small towns and the natural environment. Don and Terri have traveled over most of North America and Europe and in addition, they have visited many parts of Asia, South America and the Far East. The other day, I thought I overheard him discussing the purchase of the Maid of the Mist to take family and friends on a trip around the world. Bon voyage, Don! We’ll miss seeing you in the lab, but please stop by from time to time to tell us about your adventures. I see smooth sailing ahead.