

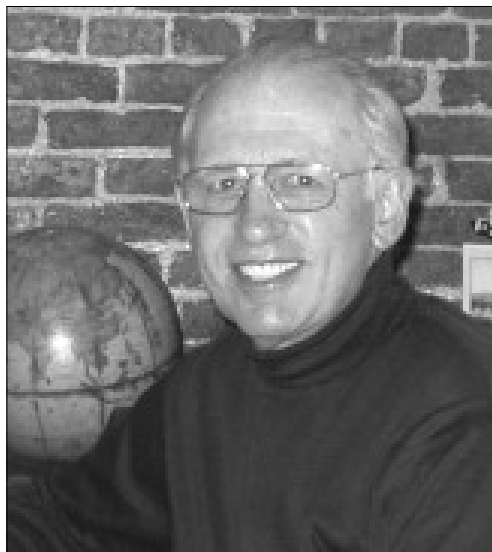
# OUTSTANDING HEARING CONSERVATIONIST AWARD

*Established in 1990, the Award for Outstanding Contributions to the Field of Hearing Conservation is given to a person whose work is exemplary in our field. It is a pleasure to announce that this year's recipient is Dr. G. Richard Price for his contributions to hearing-loss prevention and to the evaluation of the effects of noise on hearing.*

Richard "Dick" Price was a distinguished Senior Scientist and Guest Researcher for the US Army Research Laboratory, Human Research and Engineering Directorate, Aberdeen Proving Ground, Maryland and having retired, consults, publishes, and conducts research on the evaluation of auditory hazard. His extensive body of auditory research reverberates throughout the world influencing standards, guidelines and designs for a variety of diverse military and civilian products such as air bags, toys, bicycle horns, vehicles, weapons, communication equipment and hearing protection. These familiar items impact the hearing health of individuals throughout the world daily.

As an undergraduate at the University of Delaware Dick developed an interest in physiological psychology, which in 1960 concentrated on hearing when he became a student of Dr. E.G. Wever at Princeton University, first as a Princeton National Fellow and then as a National Institute of Mental Health Fellow. His interest in the effects of intense sound on the ear grew out of a graduate seminar and his dissertation research on middle ear muscle activity in the rabbit, which added to the quantitative knowledge regarding the protective characteristics of the middle ear muscle reflex.

Following graduate school, Dick joined the Army research program as a 1LT G. Richard Price stationed at the US Army Human Engineering Laboratory, Aberdeen Proving Ground, MD. He established an electrophysiological research laboratory, which had the distinction of becoming the Army's first AAALAC Accredited animal research facility. Early on, Dick realized the effects of intense sound on the ear were a critical problem not only for the Army, but also for society as a whole. However, at that time the profession possessed only a



sketchy understanding of the fundamental mechanisms responsible for noise induced hearing loss. What resulted over years of diligent effort was a two-pronged approach to the noise problem that moved basic research to application.

First, the insightful 1LT Price established a basic research program to discover the mechanisms of loss within the inner ear. Once his team understood that mechanical stress within the cochlea was the operative mechanism and that the conductive path was non-linear, then his team's emphasis moved toward establishing an appropriate metric. The result of that program was a mathematical model of the ear designed to reproduce the multiple non-linearities in the conductive path and to predict mechanical stress within the cochlea. Dick's team first developed and validated the model for the cat ear. His team naturally worked next to transform the Auditory Hazard Assessment Algorithm for the Human (AHAH) into a human version, validating the model with the available human data. This novel model provides not only a numerical rating of hazard but also a movie of the cochlear movement designed to graphically illustrate the noise event and promote engineering

insight into making exposures safer.

AHAH is unique in that the model uses a computer program as the basis for a noise standard and is considered more accurate than existing methods in predicting intense noise hazards. The methodology is gaining acceptance internationally as a noise standard. In fact, the Society of Automotive Engineers uses AHAH for airbag design and the US Army uses this model to evaluate unprotected exposure to intense sounds. As a result of Dr. Price's research, the US Army is producing a revised MIL-STD-1474 that includes AHAH. Dick's research team continues to develop additional versions that will include varieties of hearing protection. The heuristic value is evident as ear model development continues to spawn new areas of research within government and university laboratories.

Secondly, Dr. Price's military experience illuminated the challenges researchers face in discovering and quantifying the importance of the sense of hearing to the combat soldier. Dick understood the military would never take hearing conservation seriously unless research could document and demonstrate the significance of hearing as it relates to battle task performance and mission success in one of the most acoustically complex landscapes on earth - combat. Dick's research team tackled the challenge and began experimentation by systematically degrading soldier and tank crew hearing. They documented the consequences of degraded hearing on situation awareness, speech communication and coordinated activity on the battlefield. In the process, his team also created a sound propagation model as well as a non-detectability standard for the Army.

These landmark studies linked mission success to hearing and crew communication.

These studies resonated with military commanders, soldiers and hearing conservationists. The insightful results provided a foundation to justify hearing conservation program command emphasis, auditory and hearing protection research and headgear redesign. In conjunction with the hearing conservation community over many years, Dick's work helped raise the level of awareness and concern about the importance of hearing conservation within research and development command. Human noise exposure issues now frequently dictate the design, acceptance and use of weapons, aircraft, vehicles, headgear, hearing protection and communication systems. The military now recognizes the link between the sense of hearing and successful operational performance.

Dr. Price's research program is particularly notable for its breadth of interest and the fact that it now has been successful at all levels of research. Good fortune,

accompanied by persistence over many years, allowed Dick to produce a useful product that is transforming sound measurement and analysis. He has opened the doors to design and acceptance of more effective hearing protection and technologies that promote better communication. In other words, Dick moved basic research to application!

Dr. Price is recognized internationally as an authority on intense sound exposure having presented over 60 invited seminars or professional presentations worldwide. The contributions realized from Dick's focus on predicting the auditory effects from intense sound are evident in over 85 published papers and 7 book chapters. However, the general public may not realize the military acquisition community and materiel developers often rely upon his numerous classified and unclassified military and NATO technical reports.

Dr. Price's exemplary efforts, tireless dedication and selfless service in conducting basic research and moving the results into application are extraordinary. Without question, Dr. Price's research has resulted in improved communication, situational awareness and hearing loss avoidance both on the battlefield and in civilian settings and will continue to save both lives and hearing in the coming years.

*By Nancy L. Vause*

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