

**MEMORIAL RESOLUTION OF THE FACULTY
OF THE UNIVERSITY OF WISCONSIN-MADISON**

ON THE DEATH OF PROFESSOR EMERITUS WALLACE I. WELKER

Wallace I. (Wally) Welker, professor emeritus of physiology, left us all too soon. Wally passed away on November 28, 2007 in Madison, at the youthful age of 80. With his passing, the university lost one of its most distinguished scholars. Wally was a dedicated and internationally renowned neurophysiologist and neuroanatomist with a lifetime of honored contributions to his field. He had an ongoing passion and love of family, an avid curiosity for learning, and an endless urge for travel and observing nature's wonders.

Wally is survived and deeply missed by his wife, Carol Dizack, with whom he shared over 30 years of love and adventure. He is also survived by daughters Mara Welker (Peter Caragher), granddaughter, Leta Garman (Beda Garman), great-granddaughter, Ella; great-grandson, Porter; grandson, Kale Haschak; and daughter Nila Welker (Jeff Lieberman). He was preceded in death by brothers Earl and Neil Welker; and sister, Arlene Coccari.

Wally was born in Darien Center, New York on December 17, 1926. His childhood was spent on the family farm, and it was there that he was free to explore nature in its many forms. He also became aware of and deeply influenced by broad social events, which would later come to influence the way he thought about the brain. He served a two-year tour of duty in the Philippines as a second lieutenant in the U.S. Army. Following his stint in the army he enrolled in the American University, Washington, D.C., studying government, the foreign service and the behavior of nations. His interest in psychological phenomena grew to include activities of governmental, ethnic, international and religious groups. He soon moved to Chicago and was admitted at the University of Chicago, where he was exposed to the many subdisciplines of psychology and where he developed the skills and discipline to carry out scientific experiments. His Ph.D. research on exploratory and play behavior in chimpanzees, carried out at the Yerkes Laboratory of Primate Biology in Orange Park, Florida, was the first of its kind in modern experimental psychology. It soon became clear to him that even the simplest of behaviors are the result of sequential sensory and motor events requiring complex, dynamic neural networks of the brain, and that to understand the neural bases of behavior would demand not only careful observation but knowledge of brain anatomy and physiology as well. In order to incorporate these disciplines into his scientific life, in 1954 he joined the Laboratory of Neurophysiology at the University of Wisconsin-Madison where he came under the tutelage of Clinton Woolsey and Konrad Akert. From 1957-1962 he was a Kenny Foundation Scholar and Instructor in Neurophysiology, and from 1962-1967 he had a Career Development Award from the National Institutes of Health. It was during this latter period that he was appointed to the faculty as assistant professor of neurophysiology. He was promoted to associate professor in 1963 and to full professor in 1967, a post he held until his retirement in 1990 when he achieved emeritus status.

Wally's scientific career was devoted to answering fundamental questions of the relationships of brain, behavior and evolution. "I decided early that I needed to learn about how the brain works and is constructed since the brain is the source of all our behaviors, emotions, thoughts, feelings and perceptions," he once wrote. "The mammal brain is the most complicated object in the universe. Understanding its structure and function is the predominant challenge of our time." His life-long work has had a profound influence on our understanding of the neural bases of behavior.

At the University of Wisconsin, Wally continued his interests in the ways in which animals play and explore their environments naturally and how these behaviors develop. In the decades prior, Woolsey and his colleagues had been studying systematically the sensory and motor areas of cerebral cortex in a wide range of mammalian species using electrophysiological recording methods and carefully preserving the

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studied brains for later microscopic study. This approach to the study of function-structure relationships in the brain was quickly adopted by Wally, who extended it significantly by introducing new microelectrode recording methods that could provide functional maps of cerebral and cerebellar cortex in unprecedented detail. He often used cinematography to capture behavioral sequences, later to analyze them in detail, and coupled this with electrophysiological and anatomical approaches that were pioneered in the Wisconsin laboratories. He focused his attention on the somatosensory areas of the cerebral cortex of mammals that exhibited unusual tactile behaviors, such as the raccoon, which uses its forepaws in elaborate exploratory displays, and the rat, which actively explores its environment with its facial vibrissae. Studies such as these in a wide range of mammalian species led to the general principle that the behavioral use of body parts in tactile exploration of the environment is related to the architectural arrangements of the somatosensory region of the cerebral cortex and of the subcortical structures projecting to it. This general principle has been extended to include other sensory and motor cortices. The extraordinarily detailed sensory maps he obtained with fine-grain electrophysiological mapping with microelectrodes and the correlation of these maps with cortical structure revealed cortical functional organizations not known before. These studies laid the foundation for a whole new generation of research in many laboratories around the world.

One of Wally's major studies clarified concepts regarding the functional significance of anatomical gyration, foliation and fissuration of cortex and of lobulation and subnucleation of deep cellular groups. Later research included collaborations with Roger Reep of the University of Florida and J.I. Johnson, Jr. of Michigan State University, focusing on systematic macro- and microscopic study of the neuronal architecture of the brain of the Florida Manatee.

Encouraged by two of his other Wisconsin mentors, Konrad Akert and Jerzy Rose, both of whom were world renowned neuroanatomists, what had been a limited collection of brain specimens was increased and diversified by Wally and his colleagues, with funding from the National Institutes of Health. Over nearly four decades, the collection grew to include brains from more than 100 mammalian species and became one of the premier brain collections anywhere in the world. With his long-time colleague, J.I. Johnson, Jr., the collection was stabilized, and by August 2007 the entire collection had been transferred to the National Museum of Health and Medicine at the Armed Forces Institute of Pathology in Washington DC. This museum is now home to a number of renowned neuroanatomical collections. Scientific study of the specimens in these collections has led to ground-breaking research and education projects around the world. At the museum, the Welker Comparative Mammalian Brain Collection along with other collections are now available for use by educators, scientists and scholars worldwide. With support from the National Science Foundation, over the past two decades, Wally, in collaboration with wife Carol, created the Comparative Mammalian Brain Collections and The Brain of the Florida Manatee websites, where these collections are now playing an important role through the use of computer technology in neuroscience research and education for scholars and students.

One of Wally's many scientific admirers perhaps expressed it best when he wrote: "With the passing of Wally Welker we lost a generation of Wisconsin great sensory neurophysiologists." He was beloved by all and will be fondly remembered forever by family, friends, colleagues and students worldwide for his generosity, kindness, humor and love of life.

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