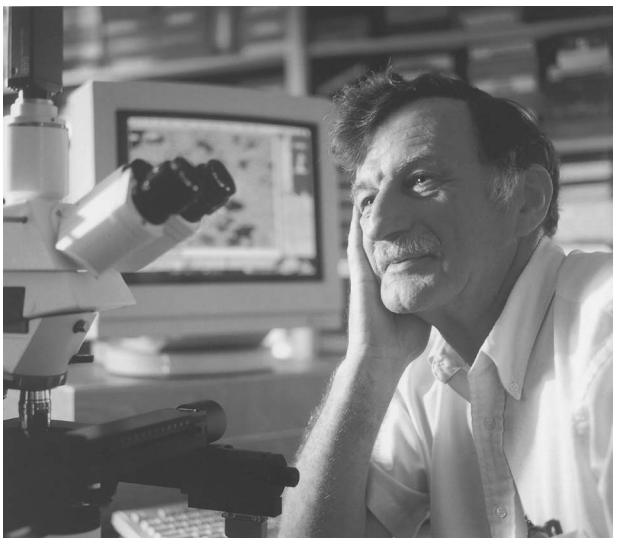
Goodbye to Edward G. (Ted) Jones, MD, DPhil, 1939-2011

The Journal mourns the passing of Edward G. (Ted) Jones, a member of our Editorial Board and for many of our Editors, a colleague and teacher. Ted was born in New Zealand, where he attended medical school at the University of Otago in Dunedin and married his wife, Sue, his lifelong companion. However, Ted was drawn to science, and accepted a Nuffield Dominions fellowship to work at Oxford University, where he did his D.Phil. dissertation work with Tom Powell. Powell, a contemporary of W. Maxwell Cowan (a previous editor of JCN), was one of the great neuroanatomists of the twentieth century, and the influence of his keen perception is still felt through his many students, among them Joel Price, one of our current editors, who was a graduate student in the Powell lab at the same time as Ted. Ted focused on the somatosensory cortex, a pursuit that was to dominate the rest of his career. They applied the relatively recently discovered methods of following degenerating axons after lesions, either with the Nauta method at the light level or with electron microscopy, to study corticocortical connections, which until then had received little attention. Those three years with Powell were remarkably productive, leading eventually to 23 publications, among them the classic work on converging sensory pathways in the cerebral cortex of monkeys (Jones and Powell, 1970). The principle of multimodal convergence areas in the frontal, parietal, and limbic cortex underlies much of our current understanding of higher order cognitive function.

After returning to New Zealand for three years, Ted was recruited by Max Cowan to be an associate professor in the Department of Anatomy and Neurobiology at Washington University. This was an extraordinary time, and in the 1970's Cowan had assembled a department that included not only he and Ted (two of the giants of that generation), but also Joel Price, Tom Woolsey, Harold Burton, Arthur Loewy, Larry Swanson, and Dick and Marie Bunge (all of whom were major contributors to JCN), among others. Max, of course, was the editor of JCN during those years, and he added Ted to the Editorial Board, where he ultimately served as a kind of associate editor (on the masthead he was listed above the editorial board, but not given a special title). Around the time that Ted arrived, Cowan and his colleagues had recently introduced a new generation of axonal tracers for anterograde and retrograde labeling of neuronal connections. Ted took advantage of this new technology, and soon established a number of important principles of thalamocortical connectivity, including mapping the intralaminar thalamic projection to the cerebral cortex (Jones and Leavitt, 1974), and the laminar distribution of the cortical projections of thalamic relay nuclei (Jones, 1975), as well as the laminar origin of cortical projections to the thalamus (Wise and Jones, 1977) and other cortical areas (Jones and Wise, 1977).



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During this era, Ted also taught neuroanatomy to medical students, and tutored my group of medical students in the laboratory. We would gather around the microscope while he alternately challenged us, entertained us with his stories and historical anecdotes, and revealed the brain to us, often one neuron at a time. Ted also took out time to serve on my own PhD dissertation committee. Our work had overlapped in finding projections to the basal nucleus of Meynert, resulting in our one co-authored paper (Jones et al., 1976). During the spirited discussions concerning these connections, I was impressed with Ted's erudition and critical thinking, which set a standard for me for the remainder of my career.

In the late 1970's, immunohistochemistry had just come into widespread use. Ted used this important new tool to understand the cortical interneurons, which he had previously classified with Golgi methods. By applying antibodies against glutamic acid decarboxylase and

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various calcium-binding proteins and neuropeptides, he was able to show the chemical specificity of different classes of cortical interneurons. I overlapped with Ted on the faculty at Washington University in the early 1980's, when he had moved his lab to the Department of Neurology and Neurosurgery. He had recently been appointed the Bishop Scholar in Neuroscience, and was using the opportunity of reduced administrative and teaching responsibilities and an enlarged lab to expand his research into neurophysiology. As a new assistant professor in neurology, it was a special treat for me to be able to observe his artistry in the darkroom, which we shared. During that era, the photography was still done on film and discriminating scientists like Ted would print the photographs themselves to get the best possible images for their publications. Those who are familiar with Ted's work will remember the crystal clarity of his photographs. Ted was a master at bringing the best out of the material.

In 1984, Ted moved to the University of California at Irvine. During this same period, he also established a laboratory at RIKEN in Japan, flying back and forth across the Pacific Ocean to keep two laboratory groups going. During this period he worked on activity-dependent changes in connectivity and gene expression in the cerebral cortex (Jones et al., 1997; Jones et al., 1990). In addition to building a distinguished Department, Ted found time to produce the first edition of his magnum opus, *The Thalamus*, which appeared in a second edition in 2007, and remains the definitive work on this part of the brain. He and Javier DeFelipe also translated and edited Cajal's writings on the cerebral cortex as well as his *Degeneration and Regeneration of the Nervous System*, and then subsequently edited a series of books on the *Cerebral Cortex*.

In 1998, Ted moved to the University of California at Davis to direct the Center for Neuroscience. That same year he also served as the President of the Society for Neuroscience. At UC Davis, Ted focused his attention on the changes in cortical neurons in schizophrenia. This work revealed a downregulation of expression of glutamic acid decarboxylase in neurons in the superficial layers of the dorsolateral prefrontal cortex in the brains of schizophrenics (Akbarian et al., 1995), which has stood up as one of the few solid advances in the pathology of this illness. As a result of his long career of groundbreaking work in the neurosciences, Ted was elected to the National Academy of Sciences of the USA in 2004.

In the last few years, Ted also became interested in developing digital atlases of neuroanatomical data, both in humans and in animals, resulting in the BrainMaps website (http://brainmaps.org/), which provides high resolution images of the brains of many of the species most commonly used for neuroscience, including humans. At this point, my path crossed with Ted's again, as we served together on the advisory board for the Human Brain Project at the Allen Institute for Brain Science. Ted's remarkable perspective, wit, and insight were critical in the way that this human brain atlas developed. A few months before he died, I had the honor of sitting next to Ted and Sue, who often accompanied him on his travels, at a dinner sponsored by the Allen Institute, and hearing about their idyllic, rural lifestyle in their home outside Davis. In the last few years I also served with Ted on the Board of Directors of the Cajal Club (of which he was President), where his leadership reinvigorated this traditional neuroanatomical society. Ted joined the Editorial Board of JCN again in 2010, where he provided a highly appreciated voice of experience and reason.

Ted was also a historian of science. One of his last papers in JCN, on chemical neuroanatomy of the human hypothalamus, was criticized by one reviewer for his spelling of "mamillary" with one "m." After a spirited rebuttal, Ted produced an entire paper, one of his last (Jones, 2011), entitled "Mamillary or mammillary? What's in an 'm'?" In it he traced the usage of the term back to the eighteenth century and demonstrated that there were two distinct clusters of scientists, one of which (including the Oxford school of neuroanatomy in which he trained) spelled the word with one "m" and the other with two. He sent a copy of the paper to the two editors for his JCN paper, Paul Sawchenko and myself. At the top of the page, he wrote "On English bards and Scotch reviewers – Byron," the title of a poem by Lord Byron that satirized his critics. He had crossed out "English" and written in "American," crossed out "Scotch" and wrote "Dutch" (a reference to his conviction of the nationality of the reviewer who had contradicted him), and at the end crossed out "Byron" and wrote "Jones."

These reprints arrived on Paul's desk and my own a few days after Ted's unexpected death. On June 6, 2011, while attending a workshop at UCLA on the connectome including Larry Swanson, Harvey Karten, and Larry Kruger (all either current or former members of the JCN Editorial Board), Ted died suddenly from cardiovascular disease. With both his contributions at the meeting and the posthumous reprints, Ted left us doing what he loved and will long be remembered for: teaching us about the brain

Clifford B. Saper
Editor-in-chief

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