

## Edwin (“Ed”) Embrey Daniel: A Tribute

The passing of Edwin Embrey Daniel (born September 23, 1925) on June 27, 2022, saw closure to a rich, varied and fruitful life.

As scientist, teacher, political activist, and agent provocateur Dr. Ed Daniel had few equals. It could be aptly said of him as was said about a fictitious King of Denmark, that *“He was a man, take him for all in all—(we) shall not look upon his like again”*.

Born in Chattanooga, Tennessee Sept 23, 1925, Ed Daniel served in the US Army from 44-46, lost his leg in France, came back to the US, got his MA from Johns Hopkins and a PhD in Pharmacology in 1952. His strong political views ran contrary to prevailing US sentiments, and following alleged harassment from the FBI Ed Daniel took refuge from McCarthyism in Canada. He came first to the University of British Columbia as an Assistant Professor and then at the ripe age of 36, the first Chair of Pharmacology at the University of Alberta from 1961-1972. He was also the President of the University of Alberta Faculty Association in 1966-67, President of the Pharmacological Society of Canada in 1971-72, and Canadian representative to the International Union for Pharmacological Sciences (IUPHAR).



Ed Daniel moved to McMaster University in 1975 and set up a novel Smooth Muscle Research Programme in 1978. He was instrumental in setting up a PBL-Co-op Programme for Undergraduates in 1989. He retired as Professor in the Department of Biomedical Sciences in 1994 and remained as Professor (Emeritus) before returning to the University of Alberta in 1998 where he was an adjunct Professor in Pharmacology until 2010. He trained many scientists (Masters, 14, PhDs, 33, Post MDS, 26, and 21 postdoctoral fellows). Starting in 1950 until 2010, he published 594 papers in peer-reviewed journals apart from numerous chapters in books and proceedings of symposia. He received numerous awards, visiting Professorships, and received many prestigious national and international awards that included the Janssen Award for Lifetime Achievement in Gastrointestinal Motility, the Upjohn Award for contributions to pharmacology awarded by the Pharmacological Society of Canada, the Otto Kraymer award from the American Society for Pharmacology and Experimental Therapeutics, and in 1993 Ed Daniel was made a Fellow of the Royal Society of Canada.

Those facts are a capsule summary of a long and productive life as a scientist with international eminence. The facts are just that—bald, bland, bare a paper “thin” description to use an anthropological term. They miss his vibrant essence—fail dismally

to capture the context in which his work was done and the impact he had on the community he served so wisely and well. A “thick” description is needed (to return to another term from anthropology). An attempt at one follows:

Much of Dr. Daniel’s work focused on smooth muscle. He was one of the pioneers of smooth muscle research and in Canada can be credited as the Father of Canadian Smooth Muscle Research and when he began his research in the late fifties, knowledge of smooth muscle structure and function lagged behind its better studied counterpart, striated muscle. The uniformity of skeletal muscle and particularly its nerve supply made studies relatively easy. The variability of smooth muscles posed great problems. In contrast to skeletal muscles which seemed to serve a single function, smooth muscles functioned differently in different organs and the complexities of the nerve supply though intriguing made analysis very difficult and hindered the development of a unified framework. The techniques available were also limited to kymograph studies and extracellular recordings. Drs. Ling and Gerard had inserted microelectrodes into living cells in 1949, but their application to smooth muscles was slower, though Drs. Bülbring and Vaughan Williams demonstrated a device in 1951. The other techniques that Dr Daniel used extensively in his research had not been developed to a great degree nor was the equipment generally available.

What was striking about Ed Daniel’s approach was not just the range of techniques he used, but his interest in smooth muscles in general. Whereas many investigators during that era confined their interests to specific sets (respiratory, gastro-intestinal, uterine), Ed studied many different types using a variety of techniques—contractility, ion fluxes, sub-cellular fractionation, and radioactive ligand binding to explore multiple facets. He worked well with clinicians, always seeking to translate basic research to a patient setting. In contrast to many senior scientists who operated by remote sensing, he worked in the lab himself. It was pleasant for us to walk by and chat with him as he sat next to the dog watching the traces. A marvelous role model for hands-on science.

Using a repertoire of diverse techniques, Ed Daniel, his students, and colleagues explored many aspects of smooth muscle function that included the importance of the regulation of sodium and calcium homeostasis, slow waves, and the Interstitial Cells of Cajal (ICC) in the gut, gap junctions in the uterus, and the role of caveolin. His emphasis on linking structure and function was particularly relevant for his work on gap junctions in the uterus and studies on ICC in the gut.

Ed Daniel’s wide-ranging interests required him to keep abreast of many different areas. His graduate students received sets of reprints in their mailboxes targeting their projects. Long before the ubiquitous search engines made students indolent, scientists had to solicit reprints by mail after searching Current Contents. Ed was assiduous in this regard. He had not only read the articles he received, but circled specific phrases for scrutiny, with the ominous phrase—*“see this, tell me what you think”*, which meant serious questioning at the regular lab meetings.

Ed Daniel also brought the same level of professionalism that he advocated for research and teaching to peer review and was a strong believer in transparency and

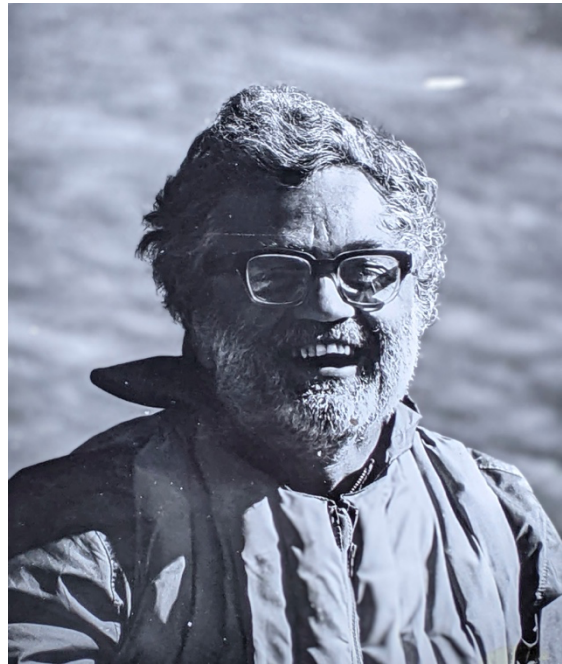
believed that reviewers should back-up their reviews by signing their names. Ed was also very much active in environmental issues first in Alberta and later elsewhere including British Columbia. At the University of Alberta, he founded in 1970 the public interest group with the name - "Interdisciplinary Committee for Environmental Quality" – the ICEQ. Members of the ICEQ were largely professorial colleagues from many disciplines: Medicine, Biology, Science, Social Sciences and Law. Ed felt that all of these should bring their expertise to bear on the emerging environmental crisis concerns, dealing with man-made pollution in its various forms, realizing that a multidisciplinary approach was needed to support political and technical changes. The ICEQ became a force to reckon with on many levels of public policy and political action - in a province that was on the verge of massive technological developments in the gas, oil and coal industry with all the many threats to the environment, the lands and the lives of its citizens. Ed Daniel initiated one major practical activity by bringing the Alberta Fish and Wildlife Society on board and having dozens of its members participate in an investigation of the water pollution status of the North Saskatchewan River, by bringing their boats and helping other volunteers and many academic colleagues to carry out a systematic water sampling collection and subsequent analysis of water purity and pollutant levels. Ed Daniel and the ICEQ were a force that politicians and government agencies in Alberta had to deal with and respond to in those days.

Throughout his research career, Ed Daniel took teaching seriously. He taught a wide range of students—undergraduate science, medical, pharmacy and graduate. The standard lecture format was not his forte. His slides were complicated, and his voluminous knowledge and awareness of subtleties made it difficult for him to dumb down his message to take home points—a favorite ploy of popular teachers then. On a rare occasion though, he was brilliant in that format. Once when he forgot to come to the class, he rushed in at the last minute and using no slides, but just the repository of knowledge in his spinal cord gave a superb exposition of the problems facing smooth muscle research. The students sat stunned at his clarity and vision. Those performances were rare. Ed was superb with small groups—provocative, challenging, probing. He fostered dissent and thrived on argument. He even seemed embarrassed by deference and tried his best to discourage it. Those sessions were lively, exciting, and memorable—adrenaline rushes that lingered long.

At all levels, Ed Daniel fostered active learning. For medical students at the University of Alberta he created two exercises—the autonomic unknown and the drug advertisement project. Both of these initiatives got students thinking deeply about pharmacological issues and the latter forced them to confront the veracity of claims made about the value of prescribed drugs. That project had an interesting spin-off. One of the students who took that course was stimulated about evaluating evidence and later became one of the leaders of Evidence-Based Medicine. The seeds that he sowed took deep root. Later at McMaster University, he was instrumental in shepherding a novel undergraduate science programme that linked academics with the complexities of working in industry and health agencies. That programme spawned graduates who like pluripotent cells flourished later in many domains and became active researchers, lawyers, consultants, entrepreneurs, and physicians.

No account of Ed Daniel's life will be complete without a comment about his political activism. That began early, soon after he returned from the Second World War as a veteran with an amputated leg and a prosthesis. As a graduate student and a veteran, he sensed the irony that those who had fought to liberate Europe from fascists were castigated for befriending fellow Americans of African descent and espousing movements that promoted peace, as though fighting for liberty and justice was done only in foreign lands. When he ran afoul of the notorious Un-American gang, he left his native land for Canada where he continued his struggles against injustice long after he retired from active professional life.

The early amputation of a leg did not in any way deter Ed from enjoying adventure and this included skiing in the Canadian Rockies and also canoeing. One such canoeing adventure that took place in 1972 is detailed by Hans Baer (at that time a faculty colleague of Ed's at the University of Alberta) in a book with the title: *"Canoeing the Little Nahanni and South Nahanni"* and is available on kindle. Their journey almost ended when their canoe hit a boulder, but they were able to repair and continue in part by the use of locally provided spruce logs and gum, and the liberal application of tape. After surviving several near-drowning accidents the canoeists, demonstrating great physical and mental determination and with the help of a native guide, completed their adventure. They were met at the pre-arranged rendezvous by a rescue party consisting of Denis Crankshaw, Jean Bolan and Michael Cook. This picture taken at the Liard River pick up site reflects and to quote fellow canoeist Hans Baer: *"his joy and relief"* on successfully completing another challenge.



An important reflection from a former colleague at the University of Alberta, Hans Baer, indicates how he helped foster the careers of students, trainees and junior faculty: *"Ed Daniel has been critically supportive to more students, postdocs and collaborators than any academic I have known - and that included me when he hired me as an assistant professor in 1969 (despite the fact that I accidentally ate his dinner buns during the initial interview at Atlantic City) and later alerted me to an opening at the very best of the Caribbean offshore medical schools where, with his start up help, we developed an effective small group teaching program which incorporated his experiences with group teaching at McMaster University. I am happy that to some extent I was able to pay him back by sharing with him unique adventures in white water canoeing that he still recalled up to his last days as his most rewarding outdoor experiences."*

At 96 and in failing health, Ed Daniel preferred a scientific solution by choosing assisted dying. He is survived by his wife Virginia Posey Daniel, his half-brother Randy (Lois) Daniel, sons Mike (Carleen Ellis) Daniel and Tim (Madelene) Daniel, and grandsons Benjamin James Daniel and Matthew Jarrett Daniel.

There is a remarkable thread of consistency through all his actions in research, teaching, and activism—an unwillingness to take things for granted, an ingrained skepticism of perceived wisdom, to argue, dissent and question. He was one of a rare and remarkable kind, the “truly great” as Spender would say. *“What is precious is never to forget” ... “and left the vivid air signed with their honour”.*

This tribute to Ed Daniel was written by PK (Chari) Rangachari with contributions from Chris Triggle, Jean Crankshaw, and Hans Baer.

Acknowledgements: Photographs: Dr. Daniel with microscope © Tim Daniel 2022; Thumbs Up © Virginia Posey Daniel 2022; Joy and Relief © Hans Baer 2022.



Please consider contributing to the scholarship fund at the U of A. It is called: **Dr Edwin E Daniel Graduate Scholarship in Pharmacology** - The scholarship is listed on the University of Alberta site here:

<https://www.ualberta.ca/pharmacology/programs/graduate/financial-assistance/awards.html>

An account of Ed Daniel’s 58 years in academia and written by Ed Daniel can be read in the Canadian Journal of Physiology and Pharmacology:

Daniel E.E. Fifty-eight years in science – a commentary. Can. J. Physiol. Pharmacol. 83: 657–663 (2005) doi: 10.1139/Y05-078