

IN MEMORIAM

Masahiro Kamekura · William D. Grant

Donn J. Kushner, 1927–2001

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On 15 September, 2001, Donn Kushner, Professor Emeritus, University of Ottawa and University of Toronto, passed away in Toronto at the age of 74, after a valiant struggle against two serious conditions. It is very sad that the extremophile community has lost one of its most eminent scientists.

Born in Lake Charles, Louisiana, Donn studied at Harvard University (BSc 1948) and McGill University (MSc 1950, PhD 1952), where he married Eva Dubska on 15 September, 1949. Donn spent 2 years doing postdoctoral research at Montreal General Hospital Research Institute, then moved to the Department of Agriculture in Sault Ste. Marie (1954–1961), and to the National Research Council in Ottawa (1961–1965). He joined the University of Ottawa in 1965 as Associate Professor and was promoted to Professor of Biology in 1967. In 1988 he joined the Department of Microbiology and Botany and the Institute of Environmental Studies at the University of Toronto as Professor, and in 1992 became Professor Emeritus in the Department of Botany. He was President of the Canadian Society for Microbiology (1980–1981), a fellow of Victoria College (1988–1992), Editor of the *Canadian Journal of Microbiology* and of *Archives of Microbiology*. He served as a member of the International Committee on Systematics of Prokaryotes – Subcommittee on the Taxonomy of Halobacteriaceae ever since its inauguration in 1982.

Donn's graduate research training was in the area of adaptive enzyme synthesis in bacteria and yeasts. In the late 1950s, he began his studies on the growth of bacteria under extreme conditions. He first studied the alkali resistance of a strain of *Bacillus cereus*, a pathogen of the larch sawfly. His interest was aroused by the extraordinarily high pH (9.5–



10.5) found in the midgut of these flies. In 1961 he accepted a position as an associate research officer at NRC as a member of a group headed by Dr. N.E. Gibbons, a pioneer researcher on extremely halophilic bacteria. Although preceded by many distinguished forerunners, such as R.M. Baxter, A.D. Brown, J.H.B. Christian, I.E.D. Dundas, W.L. Flannery, M. Ingram, M. Kates, H. Larsen, and others, he soon became a leading scientist in the field of halophiles. He carried out detailed investigations on the ribosome structure and cell envelopes of *Halobacterium cutirubrum* (now *H. salinarum*) in collaboration with S.T. Bayley, H. Onishi, and others. He also studied other extremophilic, psychrophilic marine bacteria.

In 1965 he moved to Department of Biology, University of Ottawa, where he continued his studies on halophiles, *H. cutirubrum*, *Vibrio costicola* (now *Salinivibrio*), *Halomonas* spp., and psychrophiles. His group made important advances in the knowledge of growth requirements, the effect of salts on protein synthesis and enzymes, the active transport of amino acids, protein turnover, and lipid chemistry. His interest extended further to the interaction of heavy metals with microorganisms. During his academic activities at Ottawa, he attracted a steady stream of graduate students, postdoctoral fellows and visiting professors, and he enjoyed friendly collaboration with R.A. MacLeod, G.D. Sprott, and M. Kates, among others. His numerous publications, including original papers, book chapters, and reviews, established him as a leading expert in the field of extremophiles. In 1978, he edited a seminal and

M. Kamekura (✉)
Noda Institute for Scientific Research, 399 Noda, Noda, Chiba
278-0037, Japan
e-mail: mkamekura@mail.kikkoman.co.jp

W.D. Grant
Department of Microbiology and Immunology, University of
Leicester, Leicester, UK

much-quoted book entitled *Microbial life in extreme environments*.

After he moved to Toronto in 1988, he undertook new projects including the production by algae and cyanobacteria of fibrils that are involved in the movement of heavy metal pollutants in water columns, and the growth of microorganisms in heavy water. His last paper on the green algae *Scenedesmus acutus* was published on November 2001 in the *Canadian Journal of Microbiology*.

During my stay in Donn's laboratory, from 1982 to 1985, I found it to be a melting pot of scientists from many countries: China, England, France, Israel, Japan, Nigeria, Romania, Scotland, Spain, Sweden, and Canada. Donn used to ask anyone working in the evening "what's new?", and would always smile sweetly when he heard good news. He was proud of his three sons, Daniel, Roland, and Paul, and used to describe their latest exploits in a letter accompanying his annual Christmas card.

Donn's creative talents extended far beyond science. He wrote numerous children's books, several of which won awards and were translated into foreign languages. Donn and Eva were both avid readers, and their house in Toronto had shelves of books covering the walls of every room, and along the staircases. He was also an accomplished chamber-music player on the violin and viola. On several occasions at halophile conferences we were treated to chamber music recitals splendidly performed by Donn together with L.I. Hochstein, M. Kates, M. Kohiyama, and A. Oren.

To honor Donn Kushner's contribution to the microbiology of halophilic bacteria, an anaerobic halophile, *Haloanaerobium kushneri* has been named after him. Donn will be remembered by many people: his family and friends, the children who have been entertained and enlightened by his books, and by the large number of scientists he met during his exciting career, an illustrious one that spanned more than 50 years.