

## In memory / En souvenir de

**W**illiam George Friend, WGF, or Bill as he was known to most of his colleagues and friends, was a man of many parts. Born in 1928 in the Ottawa Valley, he showed an early interest in biology much to the consternation of his mother, who would find jars of collected creatures welcoming her when she opened the fridge. At the age of 15, he began 6 years as a summer-student assistant in the Field Crop Insects Laboratory in the Science Service of the Canada Department of Agriculture. He continued this as he worked on his bachelor's degree in agriculture at McGill, graduating in 1950. On a study leave from Agriculture Canada he went to the Entomology Department at Cornell to do research under the supervision of R.L. Patton, gaining his PhD in 1954 with a thesis on the vitamin requirements of the onion maggot. He returned to Agriculture Canada as a research officer for the next 4 years until he was persuaded by his good friend William "Bill" Beckel to apply for a job in academia. Thus began a 38-year career as a professor in the Department of Zoology, University of Toronto.



**William G. "Bill" Friend  
(1928-2018)**

Bill Friend, he of many parts, was equally enthusiastic about research and teaching, and being a professor enabled him to indulge in both. He also had a lifelong fascination with technology, and his choice of career allowed him to pursue that interest too. During his first years at the University of Toronto, he became heavily involved with the design and implementation of a new building for the Department of Zoology, which opened in 1965 to national and international acclaim. The Ramsay Wright Zoological Laboratories (named after the department's first chair) was a state-of-the-art building that incorporated technical innovations such as all services being routed in the walls of the main internal corridor, allowing flexibility in future reconfiguration of the labs and offices on the outside, all of which had windows. Labs were provided with non-chlorinated water for aquatic research, physiology teaching labs were equipped with low-voltage DC as well as standard AC power and darkrooms for photography and many of the teaching labs were designed for 20 students and a teaching assistant. All teaching labs were equipped with closed-circuit TV for introductory talks and practical demonstrations; at the time, TV was thought to be the medium of the future for university teaching, and Bill was a great proponent of this technology. A footnote: much later, when TV had gone out of fashion for teaching, much of the old equipment was still around, and Bill and I used some of it to film how the blood-sucking bug *Rhodnius prolixus* deployed its mouthparts during feeding. Bill loved doing things like that; he was inventive and creative in his research and teaching, as well as his outside life. More than once, as we closed a day trying out a new approach to getting *Rhodnius* to reveal its secrets, he would say "wasn't that fun? And you know, the amazing thing is I get paid for doing this!"

Bill was an inspiring and knowledgeable educator. He taught mostly at the first and second year levels, and his wide-ranging interests were evident in their subject matter: insect physiology, general animal physiology, introductory biology, biology for non-specialists, and biology for non-scientists. In the latter course, he presented contemporary ideas about human evolution. He was also keen about curricular design and teaching methodologies. He was a member of the MacPherson Committee that in the late sixties fundamentally changed the approach to undergraduate teaching in the Faculty of Arts and Science, eliminating the long-standing division

between specialist and general programs in favour of a more flexible and custom approach to course selection. In the seventies, he was a key member in a group of us that totally redesigned the approach to teaching the 2000 students in first-year biology, earning a teaching award from the Ontario Conference of University Faculty Associations. In the eighties, he served on a Council of Ontario Universities advisory group involved with important changes to the high-school science curriculum, and the development of the biology courses.

His research focused on various aspects of insect feeding. His PhD work and pre-university years looked at phytophagous pest insects and their dietary requirements, with a view particularly to the development of artificial diets for rearing purposes. During this period he formulated the first chemically-defined diet for a plant-feeding insect. After his move to Toronto, he became fascinated by the classic model organism for insect physiology, *Rhodnius prolixus*, first applying his experience with artificial diets to this haematophagous insect in determining its nutritional requirements, and guiding half a dozen graduate students through related projects. On his return from a sabbatical in Cambridge, England, in 1967, he shared with me his excitement about a novel method of studying the act of feeding in an insect such as *Rhodnius* using changes in electrical resistance. Thus began a fruitful decade and a half of collaborative research on the mode of feeding, and the chemical signals inducing gorging in these insects. Though Bill was 12 years my senior, it is a testament to his generosity and lack of ego that he always accepted me as an equal partner. I don't recall a single moment for instance where order of names on a publication was an issue!

In the 1980s, Bill added to his repertoire of insects, studying in collaboration with myself and others, chemical signals and other factors affecting the feeding of blackflies, mosquitoes and tabanids. He was particularly interested that these insects, unlike *Rhodnius*, are not exclusively haematophagous, consuming nectar as well as blood, and thus have two different modes of feeding and a more complex set of feeding stimuli. In 1988 he started a collaboration with Bernie Roitberg of Simon Fraser University to build a theoretical model of mosquito blood feeding. In Bernie's words: "We enjoyed working together and were able to develop our ideas, which led to two of the first-ever analytical models being published on malaria mosquito feeding. Over time, our ideas became accepted by the scientific community and form part of malaria-management models currently under development in the east and south African continent."

The third part of his life was equally rich. He married his forever partner, Shirley, in 1954, and together they looked after their mothers in Ottawa, sailed, cooked, travelled, entertained, "adopted" several godchildren, and enhanced the lives of those they knew and cherished. When Bill joined the University of Toronto, they bought a house in Port Credit near the lake, and maintained a sailboat (a "Shark") in the local yacht club. I remember many an evening coming close to last in the weekly race, but having more fun than other competitors. After a few years, they moved to a larger house in Thorncrest Village, where they had a rich social life. On Bill's retirement, they decided to join lifelong friends on the west coast, and relocated to West Vancouver. Here, Bill continued involvement in academe, becoming an adjunct professor at Simon Fraser University, where he helped students in Bernie Roitberg's lab with microscopic and dissection techniques, writing their theses, and providing critical comments at lab meetings. Outside academe, he and Shirley continued to sail and travel. Bill pursued his interest in music, practicing the flute and the ukulele, and took up First Nations-inspired carving, producing many beautiful masks. He was active in the elder community, helping others with their technological and computer challenges. He continued to nurture and inspire his godchildren.

Bill passed away quietly on 16 December 2018 from complications following a fall. He will be greatly missed by his friends, adopted family, and colleagues.

J.J. Berry Smith  
Emeritus Professor, University of Toronto