

Geoffrey G.E. Scudder: Zoologist, Conservationist, and Educator

Rob Cannings, Syd Cannings, Karen Needham, and John Spence

Professor Geoffrey George Edgar Scudder B.Sc., D.Phil., FESC, FRES, FRSC, OC, a giant of Canadian entomology, passed away in Vancouver, British Columbia on 4 July 2023, after several years of poor health. Geoff had distinguished himself through exemplary service in science that had unusual influence from local classrooms to the world stage. We were fortunate to know him as a friend, colleague, and mentor and offer this tribute in celebration of his life and accomplishments.

Geoff Scudder was born on 18 March 1934 at Fawkham, Kent, UK. At the age of 12 he knew he wanted to be an entomologist and began pursuing that dream. In his high school years at a boys' grammar school in Gravesend, Geoff was greatly influenced by his gifted biology teacher, R.D. Ellis and, with the encouragement of an amateur hemipterist, H.K. Airy Shaw, he began studying Heteroptera (Scudder 2008).

In 1955, Geoff graduated with First Class Honours from the University of Wales, Aberystwyth, which he attended because Mr. Ellis had studied there, leaving Geoff with a highly positive impression of the school. Three years later, in 1958, at the age of 24, he received his doctorate in entomology from Oxford University on the basis of a ground-breaking dissertation about the comparative morphology and evolution of insect female terminalia. As he told the story, the only change he was required to make before acceptance of the thesis was to substitute the word “terminalia” for “genitalia” in the title “...because it was thought the term “genitalia” might be unacceptable to the higher authorities at the university.” (Scudder 2008). Geoff and Jacqueline Howard were also married that same year and moved to Vancouver, where Geoff had accepted a faculty position in the Zoology Department at the University of British Columbia (UBC). Daughter Nicola Claire was born in Vancouver in 1965. They made their home in Vancouver, where Geoff spent his entire post-graduate university career, from 1958 to 1999, at UBC and served as Professor Emeritus until his death. He was made an Assistant Professor in 1960, promoted to the rank of Professor in 1968, and served as Head of the Zoology Department from 1976 to 1991 (Figure 1). Geoff was highly regarded at UBC and remains the only UBC faculty member ever to receive all four of the highest honours the university bestows—the Master Teacher Award (1976), the Killam Research Prize (1989), the President's Service Award for Excellence (1993), and the UBC Alumni Faculty Citation Award (1997).



Figure 1. Professor Geoffrey G.E. Scudder, circa 1991.

Zoology Department, University of British Columbia.

Rob Cannings (rcannings@royalbcmuseum.bc.ca) is Curator Emeritus of Entomology at the Royal British Columbia Museum in Victoria, BC. *Syd Cannings* (syd.cannings@ec.gc.ca) is a Species at Risk Biologist for the Canadian Wildlife Service (Environment and Climate Change Canada), based in Whitehorse, Yukon. *Karen Needham* (karen.needham@ubc.ca) has been the Curator of the Spencer Entomological Collection at the University of British Columbia, Vancouver, BC, since 1991. *John Spence* (john.spence@ualberta.ca) is a Professor Emeritus in the department of Renewable Resources at the University of Alberta.

In his brief scientific autobiography (Scudder 2008), Geoff modestly described himself as belonging to the “group of biologists that includes field or museum naturalists who enjoy working outdoors and who often collect a favourite group of organisms and study systematics, ecology, behaviour, and the like.” He was indeed such a scientist but was much more. How does one begin to describe the phenomenon that was Geoff Scudder? Superb zoologist. Intellectual whirlwind, prodigious writer, forceful speaker. Enthusiastic and supportive teacher and mentor. Relentless researcher, tireless insect collector, curious naturalist. Efficient administrator and organizer. Dedicated conservationist, lobbyist for biological causes and servant of science. A dynamic but unassuming, kind and private man. In short, Geoff Scudder was a highly accomplished academic and scientist known and deeply respected across Canada and around the world.

As is true for many energetic personalities, retirement hardly changed Geoff’s life. For example, he published about as many peer-reviewed papers in 2001 (7), two years after retirement, as he did in 1977 (8), in the middle of his career. However, he never would have considered counts of published papers as a proper gauge of his contribution—his work resulted from his desire to learn and to transmit knowledge about the world he loved. Despite periodic bouts of serious ill-health over the years, Geoff continued to astound all who knew him with his energy and “I’ll do that” attitude. His work ethic was legendary. Some of us who served at his side on the Biological Survey of Canada recall more than once finding him working late at night after a day-long Ottawa meeting or a long flight East, identifying bugs in the Canadian National Collection of Insects, only to discover the next morning that he had returned to his hotel room to write grant proposals or manuscripts from 3 to 6 AM. That might not be a recommended practice, but that was Geoff in action! That’s one way he got all that work done.

At UBC, fresh from his doctoral studies at Oxford, Geoff replaced Professor George Spencer, the famous, long-serving zoology and entomology professor who had retired two years before. The charismatic Spencer was a hard act to follow, but Geoff, although more reserved than his predecessor, succeeded brilliantly. He established the Spencer Memorial Lecture to honour Spencer, over the years inviting dozens of international luminaries to UBC to speak on insect biology—for example, the first to lecture was the legendary insect physiologist, Sir Vincent Wigglesworth. In 2001, after his own retirement, this lecture series was succeeded by the Geoffrey G.E. Scudder Lecture in Entomology, a tribute by his students and colleagues to his influence. Like Spencer, Scudder loved the open rangeland of the Dry Interior of British Columbia and, although he energetically travelled the whole province studying its insects, early in his UBC career he made the Cariboo–Chilcotin region the focus of his field studies.

Researcher and Writer

Geoff Scudder published 248 peer-reviewed papers, 6 books, 12 book chapters, and more than 100 other articles, mostly on entomological subjects. A summary of his work, including references to selected papers, is given here to illustrate the breadth of his interests and the accomplishments of his research.

Scudder’s early interest in Hemiptera resulted in publications during his university studies. His first refereed paper was co-authored by his boyhood friend and early colleague in Hemiptera systematics, the well-known British ecologist Sir Richard Southwood. Its subject was the life histories of two British lace bugs (*Tingis*) on thistles (Southwood and Scudder 1956). Years later, Geoff briefly returned to the Tingidae (Scudder 2012), this time in the Canadian fauna. Other early papers on faunistics and taxonomy (Scudder 1956a) also resulted from his undergraduate studies in Wales.

While at Oxford, his first of dozens of papers on the seed bugs (Lygaeidae) appeared, many concerning foreign faunas (Scudder 1956b, 1957a). For decades, Scudder was a world authority on these insects, concentrating on the Subfamily Rhyparochrominae (now considered a separate

family) from around the world (Scudder 1957c, 1962, 1971e, 1984, 2016, 2019). Overall, in the seed bug fauna, he described two families and about 70 genera and 280 species. He studied lygaeids in most world regions—especially in North America, Africa, Asia, and Oceania—and participated on expeditions and research projects in Kenya, Tanzania, Indonesia, Malaysia, Singapore, Hong Kong, Australia, and Papua New Guinea. He visited most of the major world biological museums and spent extended periods working in the Natural History Museum (London), the Russian Academy of Sciences (St. Petersburg), the Canadian National Collection of Insects (Ottawa) (Figure 2), and the Bernice P. Bishop Museum (Honolulu). He was a Research Associate of the Bishop Museum and the Royal British Columbia Museum.



Figure 2. Geoff Scudder at Canadian National Collection of Insects, Ottawa, Ontario, May 1960.

Spencer Entomological Collection, Beaty Biodiversity Museum, UBC.

Of course, Hemiptera of all sorts fascinated Geoff throughout his career; in addition to his international systematic studies, he made impressive contributions to the understanding of the systematics and diversity of the Canadian fauna (Scudder 1963, 1971b, 1987, 1991, 1993a, 1997b, 2010a; Maw et al. 2000; Scudder and Schwartz 2001; Scudder and Footitt 2006; Scudder et al. 2010; Larson and Scudder 2018; Footitt et al. 2019). He was the Canadian expert on the Suborder Prosorrhyncha (=Heteroptera) and produced systematic syntheses treating the Pentatomoidea, Lygaeoidea, Miridae, and aquatic and semiaquatic Heteroptera of Canada. The last paper in Geoff's long and fruitful publishing career was a short note solving a taxonomic problem in the hemipteran family Oxycarenidae (Scudder 2021).

Despite all his work with the Hemiptera during his student years, Scudder's doctoral research was his ground-breaking and original investigation of the insect ovipositor. In this work he stressed the importance of the abdominal structure of the Lepismatidae (Order Thysanura) in the interpretation of female genitalia (Scudder 1957b, 1957d, 1961a, 1961b). Also, in an important early paper (Scudder 1959), flowing from his dissertation at Oxford, he described the heteropteran female genitalia and its role in classification. His 1971 paper in the *Annual Review of Entomology* (Scudder 1971a) is perceptive summary of what was then understood about the comparative morphology of insect genitalia.

Scudder's interest in morphology was not restricted to taxonomic questions concerning the Hemiptera or to comparative studies on insect genitalia. Publications ranged from evolution of the thoracic ears in Lepidoptera (Yack et al. 1999) to the evolution of the secondary palate in vertebrates (Shah et al. 1990). His teaching background in morphology and developmental biology was broad, too, and many UBC undergraduates probably recall the enthusiasm with which he drilled the comparative morphology of the vertebrate cranial nerves, aortic arches, and other critical evidence of evolution into their brains. He investigated the structure and development of insect flight muscles to clarify the biology and ecological roles of populations of aquatic Hemiptera (Corixidae, Notonectidae, Gerridae) that display various reductions of wings and musculature and a corresponding variability in their ability to disperse by flying (Acton and Scudder 1969; Scudder 1971d, 1972, 1975; Scudder and Meredith 1972). He studied the structure and function of Malpighian tubules in water boatmen (Corixidae) to explain the distribution of various species of these bugs in saline lakes and ponds (Jarial and Scudder 1970).

These last examples are part of the research that Scudder and his many students from the 1960s to the 1980s undertook in the saline lakes on the grasslands of the Cariboo-Chilcotin and Thompson regions of British Columbia (Figure 3). These projects were eclectic and varied, but most centred on the adaptations of aquatic insects to saline environments. For example, many studies, both physiological and ecological, were undertaken on the osmoregulation of corixids to account for their distribution among the varying salinities of



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Figure 3. Geoff Scudder at a field camp, Westwick Lake, Cariboo region, BC, May 1970.

the lakes. Insect survival in saline environments is related to the permeability of the integument (Oloffs and Scudder 1966; Cannings et al. 1988), the ability to modify the uptake of ions from the water, and the ability to osmoregulate the composition of the urine (Scudder 1976b). Scudder worked extensively on osmoregulation in corixids (Scudder 1971c; Scudder et al. 1972), finding, among other critical results, that apparently there is neurosecretory involvement in osmotic and ionic balance (Jarial and Scudder 1971).

All sorts of other ecological and evolutionary research on the aquatic insects of these saline habitats occurred during this fruitful period. Studies of faunistics and diversity (Scudder 1969, 1971b; Cannings and Scudder 1978), taxonomy and life-histories (Scudder 1966; Jansson and Scudder 1974; Cannings and Scudder 1979; Rowe and Scudder 1990), community structure (Spence and Scudder 1980; Lancaster and Scudder 1987), competition (Scudder et al. 1972; Bennett and Scudder 1998), feeding and predation (Jamieson and Scudder 1977; Reynolds and Scudder 1987), behaviour (Spence et al. 1980a) and physiology (Scudder 1971c; Spence et al. 1980b)—especially on the Corixidae, Gerridae, and Chironomidae—occupied the talents of Scudder and many students and colleagues.

Another strong branch of study in the 1970s and 1980s was the morphological and physiological research linking Scudder's interests in the lygaeid bugs and the evolutionary significance of warning coloration. This work focused on species of brightly coloured, red and black Lygaeinae such as *Oncopeltus fasciatus* (Dallas) and emphasized the defensive role of the cardiac glycoside heart poisons that these bugs sequester from milkweed plants. Scudder and his students showed how these insects are adapted to living on these poisonous plants (Scudder and Duffey 1972; Isman et al. 1977), how they isolate and sequester the cardenolide chemicals (Scudder and Meredith 1982), and how they use them in their defence against predators (Moore and Scudder 1985; Scudder et al. 1986).

Geoff's writings ranged widely in other areas. His interests in biogeography and faunistics resulted in many papers on insect groups other than Hemiptera (Vickery and Scudder 1987; Klimaszewski et al. 2012), especially in BC (e.g., Scudder 1976a; Scudder and Cannings 2009; Pohl et al. 2015; Ratzlaff et al. 2017). In his retirement he led a major effort to document the morphology, biology, and diversity of the insect families of British Columbia. His synthetic treatments of various faunas and biogeographic themes are well known, especially his significant contributions (Scudder 1979a) to *Canada and Its Insect Fauna* (Danks 1979) and his tireless work with insect surveys and publications concerning the Yukon fauna (Scudder 1997a, 1997b) where his interests in Beringian relationships and relict northern grasslands are showcased.

He was active in documenting the biogeography of Haida Gwaii (formerly Queen Charlotte Islands) (Scudder and Gessler 1989) and in promoting the work of the Ecological Monitoring and Assessment Network (EMAN) of Environment Canada. For this organization, he coordinated and wrote several assessments of species diversity in Canadian Ecozones (Scudder 1998; Scudder and Smith 1998). Geoff's fascination with the history of biology is exemplified by his authorship of papers on past entomological studies in British Columbia (Cannings et al. 2001; Cannings and Scudder 2001).

The examples above illustrate that Geoff was broad-minded in his approach to research on insects, and furthermore, was not averse to tackling investigations of other organisms. From the taxonomy of copepods (Sandercock and Scudder 1996) to the distribution of BC leeches (Scudder and Mann 1969), from keys to the myriapod families of Canada (Kevan and Scudder 1989) to the documentation of shrew species new to Canada (caught in his insect pitfall traps in the Okanagan) (Nagorsen et al. 2001), he was strikingly eclectic in his work.

The bigger picture was Geoff Scudder's domain, too. Evolutionary and systematic theory always played a large part in his thought. He studied industrial melanism in moths in the Vancouver area (Scudder 1972) and his interest in managing species at risk drew him to study the adaptive significance of marginal populations of species (Scudder 1989). He wrote on systematic theory (Scudder 1973), species concepts, and speciation (Scudder 1974, 1979b). But at the core of these and his many other studies was a curiosity about the organisms with which we share the world and how they live (e.g., Scudder 2017).

Collector and Museum Man

Scudder collected widely across Canada and the world, and few places accessible by road in British Columbia escaped his attention. He constantly looked to expand his understanding of insect taxonomy and the status and distribution of species. This knowledge was the foundation of his passion for biological collections and his awareness of their value to science. He was a giant in the Canadian science museum community. His work centred on the Spencer Entomological Museum at UBC (now the Spencer Entomological Collection, Beaty Biodiversity Museum), where he was Director from 1958 to 1999. During the time of his directorship, the collection more than doubled in size through his collecting efforts, those of his students and curators, and from the donations that he organized. Containing over 600,000 specimens, it is an important collection for both international research on western Canadian insects (especially Hemiptera), for student training, and for public education and extension in the local community. However, the collection would not exist today without Geoff's dedication and strong advocacy. Based on his respect for and deep commitment to the value of biological collections, he thwarted several attempts to eliminate the collection in response to budget cuts.

In addition, Geoff's expert identifications, specimen donations, and curation have improved other collections across Canada and the world. His support of the Royal BC Museum, for example, was significant. He was an RBCM Research Associate since 2001 and published numerous scientific papers with museum entomologists but, more importantly, his curatorial and collections work was invaluable (Figure 4). Geoff identified more than half of the 8000 specimens of Hemiptera in the Museum's collection, many of which he donated himself. He also collected



Figure 4. Geoff Scudder and Rob Cannings, Royal BC Museum, Victoria, BC, 2017.

C. Copley

almost 32,000 accessioned specimens of many arthropod groups and many more of his specimens await cataloguing. Extensive collections from his biodiversity surveys in Okanagan grasslands and Cariboo-Chilcotin saline lakes are deposited in the RBCM collection; they provide important baseline data for ongoing studies of environmental and faunistic change.

At the end of Geoff Scudder's career, his friends and colleagues nominated him for the Bruce Naylor Award for exceptional contributions to museum-based natural history in Canada. When he was presented the award in 2020, the citation stated: "He has made a brilliant mark on academic life in our nation. But it is the tripartite work of a natural history museum curator and administrator that lies at the heart of his career—field study, collections development, and curation; research to expand understanding of the organisms collected and classified; and interpretation, the passing of the knowledge gained to the scientific community and the public."

Since 1985, Karen Needham worked closely with Scudder, first as a volunteer in the Spencer Collection, later as his graduate student, and finally as collection curator. She notes that "During that time, I considered him a role model and a mentor; he treated me as a colleague from day one, never making me feel less than equal because of my age or gender. Always willing to listen, answer any question, and share his vast wealth of knowledge, he exemplified the true meaning of collegiality and professionalism. After more than 35 years, not a week went by when I didn't seek his guidance and expertise on some collections matter, big or small, which he provided with generosity and grace. Until well into his 80s, Dr. Scudder continued to come into the collection weekly, dropping off specimens, picking up others, and letting us know of recent taxonomic advances. I learned something about the collection's history and about entomology in general every time I spoke with him. I am honored and humbled to be a part of his legacy, which extends globally throughout the entomological community and will have a lasting effect long after he laid down his forceps."

While in the field, sitting with him at some campsite table lit by a Coleman lantern or in a cramped camper or motel room, often well after midnight, Rob and Syd Cannings were always impressed with Geoff's ability to perfectly point large numbers of the smallest bugs at amazing speed. SGC recalls that he really learned how to collect insects when Geoff sent him to the Yukon in 1979 at the beginning of the Yukon Insect Survey. Geoff visited him in mid-July, looked at his Schmitt box, and said: "Is that all you've got?" With Geoff, you learned the value of volume collecting!

Like all good field biologists, Geoff recognized at a glance those species he studied and could tell you all about their lives and evolutionary relationships. His memory of past activities was impressive, too—he could recall the details of the most obscure captures years afterwards. Fieldwork with Geoff was not without humour. Rob Cannings recalls one hot afternoon when they were stopped by road construction on the Thompson River stretch of the Trans-Canada Highway. The long line of waiting cars seemed unending. Not to miss a collecting opportunity, Geoff strolled (maybe also crawled!) along the roadside wielding his sweep net and sucking on his aspirator, much to the amusement, amazement, or consternation of the watching public. Rob also remembers collecting with him on Pelee Island in Lake Erie, the southernmost point in Canada (Figure 5). Geoff had always wanted to go there because, in addition



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Figure 5. Geoff Scudder collecting aquatic Hemiptera at Scudder, Pelee Island, Ontario, June 1985.

to its interesting fauna, collecting near Scudder, the island's sole village, would allow him to indicate on his specimen labels that the insects were collected at Scudder by Scudder. Perhaps he also collected some of the local *Scudderia* katydid that day!

Conservationist

With increasing recognition of species at risk, conservation of biological diversity became a significant theme in Geoff's research. Especially after the late 1980s, he helped document the rare and potentially threatened species and habitats of British Columbia. He stressed the importance of new arthropod surveys by developing lists of target species and priorities for inventory (Scudder 1994, 1996a) and encouraged useful inventories by publishing efficient methodologies (Winchester and Scudder 1993). Using his own extensive grassland surveys (Figure 6), he studied the effects of fire and grazing on biodiversity in grasslands. This work led to a focus on conservation of the endangered Antelope-brush (*Purshia tridentata* (Pursh) DC) community and the many species of rare insects in the South Okanagan (Scudder 1980, 1993b, 2000a). Through this research he developed a detailed understanding of issues in conservation biology and the scientific credibility to push for conservation measures on both the provincial and national political stages. He published extensively on endangered species, habitat protection, and associated legislation in Canada (Scudder 1996a, 1996b, 1999, 2000a, 2000b, 2000c, 2002, 2010b; Schindler and Scudder 1999).

Geoff's deep fascination with biological diversity, his scientific commitment to exploring it, and his work in rich and special habitats threatened by human activity inevitably led him into the Canadian conservation movement. His impact on national policies was significant. As chair of the Biodiversity Science Board of Canada (1998–2000), and as a member of the Biodiversity Convention Forum (1992–2005) and the Steering Committee of the Biodiversity Knowledge and Innovation Network for Canada (2000–2005), his work was significant in developing a sound strategy for biodiversity science and conservation for Canada. He was active in the development of the Canadian Biodiversity Strategy and the Federal Species at Risk Act.

At home in British Columbia, in particular, his influence was central to protection of species and habitats on many levels. He supplied basic scientific information relevant to conservation decisions and advised many public conservation groups and governments on technical matters. Most importantly, he was an enthusiastic, outspoken, and tireless public educator—writing and speaking in strong support of conservation initiatives. Although rooted in the academic establishment, he applied his knowledge to fight hard for conservation goals in the halls of power. He was as much at home at convincing politicians and bureaucrats to change policies as he was urging students and naturalists into useful action based on their work.

Geoff worked hard to save Garry Oak habitat on the Gulf Islands and the special grassland environments of the southern Okanagan Valley, where he established a second home. He was a founding member of the Osoyoos Desert Society and was deeply involved in habitat restoration research and public education at the Society's Osoyoos Desert Centre. As an active member of



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Figure 6. Geoff Scudder in the grasslands at Kilpoola Lake near Osoyoos, BC, May 2006.

the Science Committee of the South Okanagan-Similkameen Conservation Program, he studied ecosystem renewal, conservation area design, and how landscape configurations could promote conservation of biodiversity in the southern Interior (e.g., Warman et al. 2004). He sat on the zoological expert advisory committee for the Nature Conservancy's Ecoregional Planning for the Okanagan, which undertakes conservation planning in the Okanagan Valley in both British Columbia and Washington State. In addition, as a member of the BC Invertebrate Recovery Team, he helped develop recovery strategies for threatened species in all regions of the province.

For many years, Geoff served as a Director of The Nature Trust of British Columbia, one of the most active and influential provincial organizations supporting biodiversity projects and raising money and buying land for nature conservation. To honour his work in helping preserve

the Okanagan Valley's natural environments, the Nature Trust established the Dr. Geoff Scudder South Okanagan Grasslands Research Field Station at Vaseux Lake in 2006 (Figure 7). Heavily involved in databasing and georeferencing collections of BC insects and other groups, Geoff mapped species richness and rarity hotspots in the province in order to direct biodiversity conservation priorities to where they were most urgently needed. He also worked with the Conservation Lands Forum, which developed a biodiversity conservation strategy for the province.



Figure 7. Geoff Scudder and Carl MacNaughton (Nature Trust of BC) at opening of the Dr. Geoff Scudder South Okanagan Grasslands Research Field Station at Vaseux Lake, BC, May 2006.

Teacher and Educator

During his long tenure at UBC, Geoff was considered one of the most effective teachers in the Faculty of Science. In 1975 he won the Master Teacher Certificate of Merit and, in 1976, the Master Teacher Award. He was a stimulating lecturer; his classes, especially those of his popular course on evolution, often were filled to over-capacity by the added presence of unregistered students eager to hear the master speak. In that course, his lectures were spiced with all sorts of personal experiences, from his observations on the olive groves of Kos where Hippocrates once strolled, to his visits to Down House where Darwin thought, experimented, and wrote. To keen students, at both undergraduate and graduate levels, Geoff inspired deep interest and enthusiasm for the topics of his lectures, spurring students to seek deeper understanding of the issues that he raised. Many students, in addition to learning the information, became thoughtful evolutionary biologists as a result. Student discussions and debates frequently raged after Geoff's lectures and, clearly, he approved.

During his doctoral studies with Geoff, John Spence recalls having many thoughtful discussions about education. "When I first arrived at UBC, we discussed the courses that I should take. Geoff encouraged me to study a broad range of topics to meet my formal course requirements. I was at first reluctant but he gave two reasons that convinced me: 1) one never knows where the next breakthroughs are going to come and how progress in these areas might affect techniques that could be applied in one's own field; and 2) he claimed that when he wrote

letters of recommendation for PhD students, he wanted to be able to firmly state that they were “zoologists”, in fact, he said, “biologist” would be even better. Thus, I took some botany courses and after I’d completed the required coursework, audited a good number of other courses and seminars. In the end, I understood that having had this very broad exposure to subject matter and to the people who taught these courses was a genuine strength. The result served me very well during my own career.”

Geoff encouraged students to develop an evolutionary perspective. For him it was important to understand not only how things worked, but to have some idea why they worked in particular ways, and not in others that might have seemed more effective at first blush. John Spence remembers interesting discussions surrounding a visit to UBC by the British evolutionist, A.J. Cain. “Cain, a highly regarded evolutionist, argued that natural selection was such a powerful force that it could make animals “perfect”. However, Geoff was quick to point out that this “perfection” depended both on the circumstances prevailing in a lineage pressured to adapt, and on the opportunities made possible in the surrounding environment, and that these two things together limited the perfection possible. It was a wonderful thing to watch Geoff introduce these themes of pressures and opportunities into explanations of the evolution of vertebrates in his comparative anatomy course. I was lucky to serve as a lab demonstrator in that course for three years. It had been my least-favourite biology course as an undergraduate, but Geoff’s ability to weave facts about animal structure into stories about environmental pressures and lineage potentials turned comparative anatomy into one of my favourite topics. Being able to do this, to my mind, is the earmark of an excellent teacher.”

Geoff had his own distinctive approach to evaluation of student performance. Examinations in both the Comparative Anatomy and Evolution courses gave students an opportunity to engage in evolutionary thinking through focused, written argument. Geoff had developed an interesting way of setting and marking exams and most graduate assistants enjoyed and learned much from helping with the marking. Spence recalls “amazing discussions on how to draw the best out of students that were critical to shaping my own approach to teaching and exams. For him, it was about the discovery of how a student could use the material, rather than about recollection of specific facts.” Geoff genuinely enjoyed teaching and, as a result, we suggest, was darn good at it.

Spence notes, “Eventually, when faced with the responsibility for teaching undergraduates myself, I realized that Geoff simply employed the same excellent advice about scientific writing that he’d given me early in my doctoral program. He maintained that the facts and details by themselves were just not enough, but that one had to do the mental work to link them into a plausible story. This was the challenge that he threw out to his students at all levels. Presentations needed to have a storyline. Stories did not need to include all the known facts, but they could not be at odds with any of them. It was good discipline. Such encouragement, I am sure, helped many of us navigate the twisty road between being technically competent and becoming capable scientific thinkers. As with many things, Geoff had an uncanny way of putting his finger on the heart of the matter.”

During his UBC years, Scudder supervised 28 master’s students, 10 doctoral students, and 7 postdoctoral fellows. Students were always in charge of their own projects; Geoff’s direction was never intrusive, never exploitive, for he strongly believed that the credit for a student’s work should remain with the student. Geoff’s name was included on only those student papers that he had truly co-authored by providing more than editorial input. His belief in the value of independence for his students was crucial to their success. Geoff insisted that his students take initiative and be comfortably self-directed; however, he was always there to help and advise if wanted or needed. Although often extremely busy with administrative matters, Geoff never failed to respond to student requests for meetings, even though some of these meetings

began after most others had already gone home for the day. Many of his graduate students have continued his legacy as university professors and administrators, government research scientists and conservation biologists, museum curators, medical doctors, and teachers. He has been a mentor to many—helping, supporting, and collaborating with, his former students long after their graduation. Perhaps, most importantly, through his personal example, Geoff inspired many to become better than they likely would have been on their own.

Murray Isman is one of those former graduate students. He later became a well-known entomologist, Professor, and Dean in the Faculty of Land and Food Systems at UBC. He reminisces: “Anyone who ever worked with Geoff during his time as Head of the Department of Zoology would remember the long table behind his desk, literally covered by stacks of files and loose papers. But if you ever needed something or had a query, he would know exactly which pile to go to, and he would then rifle through the papers until he found the relevant document. It turned out to be a practice that I unknowingly emulated some 35 years later as Dean!”

Influential Scientist and Administrator

Although he loved, and was dedicated to, his research and teaching, Geoff took all aspects of university life seriously. Exhausting administrative work absorbed a huge amount of his time. His independence and fairness were appreciated by the faculty and staff of the Zoology Department during his 15 years as Head (1976–1991). He was a workhorse for the University as a whole, serving on the Senate from 1978 to 1993; during most of these years he was chair of the Senate Budget Committee, a most challenging job, especially through the difficult years of fiscal retrenchment from 1981 to 1987. He was a member of the Biology Program executive from 1976 to 1991 and, for most of that time, was its chair. From 1969 to 1991 he served on the Faculty of Science Curriculum Committee, a challenging task with results important to undergraduates. The list of other committees he sat on, or chaired, is astonishing—from innumerable advisory committees on the appointment of deans and department heads to those on libraries, buildings, collective bargaining, grievances, grants, and other topics. In short, he was a valued part of the mechanics that made UBC work with ample respect for the academic tradition and in ways compatible with education in the sciences.

Geoff Scudder’s long and distinguished record of service in science, from the local schoolroom to the world stage, has inspired many. He was always a staunch supporter and promoter of entomological societies. He served as president of both the Entomological Society of BC (1966–1967) and of the Entomological Society of Canada (1986–1987). From 1976 until well after retirement, he was either an executive member or committee member of the Entomological Society of Canada and, in 1975, was awarded the Society’s Gold Medal for Outstanding Contribution to Entomology. In 1977, he was elected a Fellow of the Society. He was made an Honorary Life Member of the Entomological Society of BC in 1998. Geoff was a founder and major player in the Biological Survey of Canada (Terrestrial Arthropods) (BSC), serving on (and frequently chairing) its Scientific Advisory Committee. He contributed enormously to the BSC’s scientific work, notably its publications and the ambitious insect surveys of the Yukon Territory and the grasslands of Canada.

His influence nationally was also exemplified by his service as President of the Canadian Society of Zoologists (1989–1990), his membership on advisory committees to Agriculture and Agri-food Canada, the Canadian Space Agency, Canadian Museum of Nature, Environment Canada, and many other agencies. As a member of various granting committees of the Natural Sciences and Engineering Research Council of Canada (NSERC) in the 1980s and 1990s, Geoff helped dispense resources for biological research in Canada. In addition, as part of the National Research Council of Canada’s Monograph Editorial Board (1993–2005) and former editor of the journal *Biodiversity*, he played an important role in scientific publishing in Canada. Active in the

policy and advisory work of the Royal Society of Canada, he was elected a fellow in 1975. The culmination of all this national work was his appointment to the Order of Canada (2002) and his reception of both the Queens' Golden Jubilee Medal (2002) and the Queen's Diamond Jubilee Medal (2012).

Geoff has been recognized internationally. Involved in the American Association for the Advancement of Science, he was president of the Pacific Division (1985–1986) and an executive member for many years; he was elected a Fellow in 1998. His interest in the biology of the lands in and around the Pacific Ocean stimulated his long commitment to the Pacific Science Association, which as well as being a catalyst for scientific collaboration, engages science in improving both the environment and quality of human life of the region. From 1976 to 1995, Geoff was either chair of its Scientific Committee on Entomology or a member of the executive board; he was vice-president from 1991 to 1995. He played a large role in the organization of the International Congress of Systematic and Evolutionary Biology, being the chair of the organizing committee (1978–1980) and co-President (1980–1985).

Perhaps his largest contribution on this front was the hosting of the XVIII International Congress of Entomology in Vancouver in 1988; he was the President and Secretary General of the Congress and ran most of it out of the Zoology Head's office at UBC. This huge meeting was a resounding success on all fronts, but Geoff will probably be most fondly remembered for the huge beer tent that served as a convenient and popular meeting and discussion place for all participants.

Geoff Scudder led us by his example—love of nature, hard work, and scholarship. Geoff's energy, commitment, and accomplishments profoundly affected entomology, both nationally and internationally, and all the diverse aspects of Canadian science that he championed (Figure 8). His profound influence lives on through the work of those in his academic lineage and in the institutions that surround and support the entomological community. May the force and inspiration of his example carry us forward in pursuit of increased understanding of the world around us, just as he would have desired.

This article is based on the Introduction to a special issue of *The Canadian Entomologist* in tribute to Geoff Scudder (Cannings 2006).

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Figure 8. Geoff Scudder.

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