

Obituaries

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presentations of science he regarded as indulgent. However, with his many collaborators he was superb and friendship was central. His inputs were always positive and constructive, as he doggedly nudged the science to focus on the most useful and important questions, gently chiding those overly pre-occupied with a technical detail, and constantly injecting humour and encouragement into the process. He was a driven critic of the inexorable bureaucratization of science, and while irreverent about the political niceties of modern science, he was, at the same time, very effective in their practice. He was much amused by self-importance and prioritized his time to mentor younger scientists, with whom he was hugely popular. Simon supervised numerous doctoral students, even though he worked in University environments only briefly.

Simon lived and worked in some of the most spectacular ecosystems in the world, retaining always a great appreciation for the beauty of wild landscapes and the animals that live on them. He was an active outdoorsman, with a passion for climbing, particularly the rather masochistic form often practiced in Scotland. The history and traditions of Scottish mountaineering ran deep in him. There were few Munros he didn't know well and he joyfully imparted his enthusiasm and experience to others. Later, the ravages of middle-age led him to more tranquil pursuits including canoeing and walking. Ultimately though, Simon was a family man, a loving husband, and wonderful father to his daughters Pippa and Katie. The family homes he and Karen created, whether tucked away on the banks of the Dee or nestled into the rocky outcrops of the Serengeti, were bastions for friends and colleagues alike, and legendary for the warmth and generosity of their entertaining hospitality.

Following the award of a large European grant to study sustainable hunting in Africa and Europe he embarked on a hectic schedule of overseas travel. The week he died he was visiting conservationists in Ethiopia to set up a project, funded by the UK Darwin initiative, to link monitoring of biodiversity by local communities with more scientific approaches. He was killed when a building in which he was staying collapsed during a sudden storm. His life was full of energy, humour and friendship. His death is a sudden and huge blow to UK and international conservation at a time when his unusual combination of skills is so desperately needed, and a terrible loss to the family he adored, and who can be so proud of him.

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A scholarship scheme enabling children living in the Bale Mountains National Park in Ethiopia to attend a local secondary school is being established in Simon's memory. Donations are being channelled through the Born Free Foundation via the following website: <http://www.justgiving.com/Simon-Thirgood>



Robert L. Jefferies

Robert L. Jefferies passed away suddenly on the morning of July 8, 2009 in Toronto, from a cerebral haemorrhage. The suddenness of his passing was a shock to his many friends and colleagues, as he was in excellent spirits the morning of July 7, and engaged in a busy summer of research and meetings. While officially retired from the University of Toronto since 2001, Bob Jefferies was at the peak of his career at the time of his passing, and noted to a close colleague the week before that he was busier than ever. His research was very well funded and was widely recognized as having demonstrated how modern human activities have far reaching impacts on pristine ecosystems through the activities of migratory geese. He had two talented graduate students in the lab at the time of his death, and he was part of the IPCC team that was recognized with the 2007 Nobel Peace prize for their work on the impacts of global climate change. At home, he was blessed with a loving wife Susan, two daughters Rachel and Allison, and five grandchildren, including a newborn to his younger daughter.

Bob Jefferies was born on March 13, 1936 in Trowbridge in Wiltshire, England but grew up in Clevedon in Somerset. His interest in biology was inspired by his mother Violet, a school teacher with a strong interest in British natural history, and Mrs. Marie Yemm, the wife of the noted Professor Edmund Yemm and teacher of biology at Colston's Boarding school in Bristol, where Bob attended high school. After completing his

B.Sc. in Botany and Microbiology at the University of Bristol in 1958, Bob obtained a PhD in Plant Ecology in 1962 under the direction of Arthur J. Willis at Bristol. His dissertation addressed the mineral nutrition of calcicole and calcifuge species. From 1962-1964, he was a postdoctoral fellow in the lab of Emanuel Epstein, the noted plant nutritional physiologist in Davis, California. With Professor Epstein, Bob co-authored 'The genetic basis of selective ion transport in plants' (1964: Annual Review of Plant Physiology 15, 169-184), which was the first comprehensive and incisive review of the genetic basis of the mineral nutrition of plants. It was during this post-doc that he married Susan Locke, a native Californian whom Bob met after she crashed a party at his apartment.

In 1964, Bob was awarded a NATO/SRC fellowship at the new University of East Anglia in Norwich, to work with Professor Jack Dainty; they were to apply the emerging techniques of biophysics to plants by exploiting the large size of cells in certain macroalgae (charophytes). Professor Dainty soon moved to the University of California at Los Angeles, and later to the University of Toronto, while Bob remained at East Anglia to take up a lectureship in 1965. Bob was among the small group of young people who founded and established a new type of School of Biological Sciences, at a particularly exciting time in UEA's history. It was there also, influenced by the proximity of the Norfolk coast, that he developed his life-long research interest in salt marshes and halophytes, publishing papers on the responses of plants at Stiffkey Marsh to nitrogen, plant osmoregulation, and the population biology of halophytes. Bob was to be seen across the flat vastness of the marsh, on his knees to record quadrats, in the company of a white-coated technician (complete with clip-board); passers-by must have wondered briefly why he was out of the asylum. The impression was not helped by his young daughters who, when offered a trip to the seaside (salt marsh!) as a treat, were heard to say 'Oh, no! Not the coast...'. Tony Davy recalls an early collaboration and enduring friendship with Bob, resulting from their brief period of overlap at UEA, as an inspiration for his own work on salt-marsh ecology. Professor Dainty (who also died this year) would have a major influence on Bob's career. In addition to broadening his knowledge of biophysics, Jack provided important career opportunities for Bob. Jack hosted Bob for a short sabbatical in 1969 at UCLA, and again for a year-long sabbatical at the University of Toronto in 1973-1974. During the Toronto sabbatical, Bob was offered a full-Professor appointment at the University of Toronto, which he accepted in 1975. Among their many accomplishments, Bob and Jack

have the distinction of having been thrown out of Las Vegas following a trip to the Nevada nuclear test site in 1969. They were too busy talking science to drink and gamble, which were required activities for Vegas visitors at the time.

Shortly after his arrival in Toronto, Bob was introduced to Arctic ecosystems by his colleague Tom Hutchinson. His wife Susan noted that Bob thrived in the Arctic, and after experiencing its wildness, found that ecosystems close to civilization were too tame and too far from the Northern Lights. In 1978, Bob was invited by Fred Cooke to visit his research camp at La Pérouse Bay, near Churchill, Manitoba. His long-time collaborator, Ken Abraham, noted that Bob arrived ill-prepared for the Arctic in his trademark blue Oxford shirt, white khaki pants, sport coat and loafers. To get to camp from the esker where the plane landed, Bob had to walk 5 km along a marshy trail. This was typically Bob – entirely proper in the most unlikely of situations. While the loafers handled the situation poorly, Bob was thrilled to be there and quickly identified significant questions and got to work, measuring plants by day and graphing data at night. After three mud-filled weeks, he had data and a draft manuscript for his first goose-related study (Jefferies, Jensen and Abraham, 1979). Over the next 31 years, Bob would return each summer to La Pérouse Bay to continue his work with the vegetation and animals in the Hudson Bay Lowlands. During this period, Bob's research in and around Churchill would become his leading contribution to science, and make the Hudson Bay coastline one of the best known northern ecosystems in the world. Some of the leading publications from this work include Cargill and Jefferies (1984), Bazely and Jefferies (1985), Kerbes, Kotanen and Jefferies (1990), Hik and Jefferies (1990), Srivastava and Jefferies (1996), and Jefferies, Jano and Abraham (2006). Not published, but frequently told around dinner tables and pubs, were his tales of mud, floods, mosquitoes and black flies, and of days waiting for weather good enough to allow the return flights home to pick his group up. On many occasions, Bob defended experiments and students by frightening off polar bears with warning shots — quite a change from East Anglia.

Originally, Bob's focus in the Hudson Bay marshes was the ecology and physiology of coastal halophytes at high latitude and the impact of goose herbivory. It was Bob's breadth as a scientist that enabled him to quickly identify interactions between snow geese and the plants as key drivers of the structure and function of these sub-arctic salt marshes. Bob's research first documented how the feces from snow geese fertilized the salt-marsh plants that served as forage for their

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summer broods. A continuing component of Bob's research involved meticulously documenting this nutrient cycle and the factors controlling it. Coincident to the initiation of Bob's herbivory research program, the snow geese of the mid-continent region were in a steep population growth phase, leading to unprecedented foraging pressure on the marsh system which Bob documented first-hand. In time, the coastal salt marsh at La Pérouse Bay and similar sites would become denuded, and collapse as a functional ecosystem, to be replaced by barren salt-flats visible from Earth orbit. Bob's research demonstrated that the rapid growth of northern goose populations stemmed from events far to the south, in the heart of agricultural North America. Since the early 1950's, intensification of agriculture including higher yielding varieties and heavy fertilizer use, as well as a shift away from winter plowing, provided migrating and wintering geese with rich new foraging areas and an abundance of spilled grain. In combination with the creation of wildlife refuges and reduced hunting pressure, this large increase in their food supply allowed higher survival over the non-breeding season. Geese returned to their summer nesting grounds in better condition and in ever increasing numbers, leading to unsustainable foraging on the Hudson Bay marshes. By documenting how agricultural practices in temperate latitudes led to destruction of the Hudson Bay coastline, Bob demonstrated that global change can occur over long distances via a biological mechanism – migratory birds – rather than abiotic mechanisms such as air or water currents (Jefferies, Rockwell and Abraham 2003).

With Rudi Drent at the University of Groningen, Bob also developed parallel studies in the salt marshes of the European Flyway, allowing for a global approach to studying new threats to high latitude systems. Together with his European collaborators, Bob demonstrated that habitat degradation was also occurring in arctic Europe, in this case because of increasing populations of migrating barnacle geese, who were fattening up on spilled European grain. These contributions to our understanding of global change effects on arctic ecosystems led to Bob's selection as one of the Canadian representatives on the IPCC panel that was awarded the Nobel Peace price in 2007.

Bob impressed those who knew him with his kindness and easy-going disposition. His standards were rigorous, to the consternation of many students and some colleagues. For students, his critiques of substandard ideas could be pointed, yet Bob took care to deliver them in a constructive, supportive manner. His easy-going personality served

the scientific community well as it led to widespread collaborations and new initiatives. With Tony Davy, he initiated the First European Ecological Symposium and the 19th Symposium of the British Ecological Society on Ecological Processes in Coastal Environments in 1977, and published the Symposium Volume in 1979. For many years, he was an Associate Editor at the *Journal of Ecology*, and he served on the editorial board of *Global Change Biology* since its inception. He also served as an Associate Editor for *Ecoscience* and *Biological Conservation* in recent years. In 2000-2004, his colleagues at the University of Groningen honored Bob by appointing him to the G.P. Baerends Chair in Biology. Very recently, he was establishing links with First Nations communities, in order to interview elders in the Hudson Bay region on how the coastal ecosystems and geese may have interacted before the influence of modern agriculture. He was instrumental in the Arctic WOLVES project (Arctic Wildlife Observatories Linking Vulnerable Ecosystems), where a co-investigator, Dominique Berteaux of the University of Quebec at Rimouski noted that his breadth provided valuable perspectives to the research team. Bob's work played an important role in influencing North American wildlife management policy, including the establishment of the Wapusk National Park on Hudson Bay.

Bob's respect within the scientific community is reflected in the many tributes that arrived upon news of his death. Many commented on how Bob fostered great camaraderie with his collaborators, and that he was exceptionally collegial. His breath of expertise also stood out. For instance, Terry Chapin noted that Bob's "work was critical in showing the kinds of ecological transformations that can occur in the north and the importance of understanding the underlying mechanisms at levels ranging from plant physiology to regional vegetation change". Bob leaves behind an impressive body of work, with over 100 peer-reviewed publications (a substantial number of which are in journals of the British Ecological Society) and four edited books. Twenty-five graduate students received MSc or PhD degrees in his lab, and many are now important figures in Canadian ecology. One of the most impressive statistics from Bob's career is the number of undergraduate students he instructed. Since coming to the University of Toronto, over 30,000 undergraduate students enrolled in Bob's courses in introductory biology, second year ecology and global change ecology. Upon hearing of his passing, two of these students noted "He was so warm and approachable..." and "...was such a pleasant, inspiring and patient professor." For his students, Bob Jefferies demonstrated that one could be a dedicated scientist and first-rate instructor while also being a genuinely kind, sympathetic person. While his published work

will resonate for decades, the inspiration he provided to this large community of young biologists will be a major part of his legacy long into the future.

A scholarship has been established in Professor Jefferies' memory. Online donations to the scholarship fund can be made to the University of Toronto, Faculty of Arts and Science's web site for donations at <https://donate.utoronto.ca/give/show/12>; donations can also be addressed to "University of Toronto" (with "Robert Jefferies" in the memo line) and sent to: Office of Advancement, Faculty of Arts and Science, 100 St. George Street, University of Toronto, M5S 3G3.

Rowan Sage, Peter Kotanen, Tony Davy and Ken Abraham
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