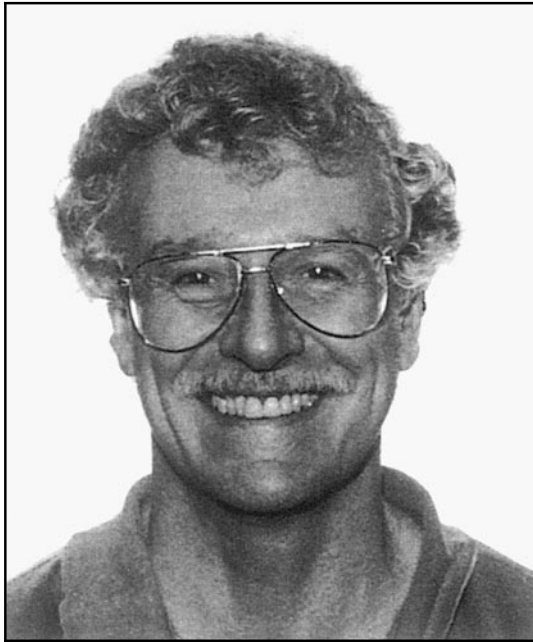


OBITUARY/NÉCROLOGIE

Robert Henry Peters 1946–1996



Rob Peters died in Montreal on 26 June 1996 at the age of 49. His death is a major blow to limnology and ecology.

In 1974 he joined the Department of Biology of McGill University and its Limnology Research Centre, after he obtained a B.Sc. and Ph.D. from the University of Toronto and held a postdoctoral fellowship in Europe. Rob did the work for his Ph.D. on phosphorus excretion in zooplankton under the supervision of Frank Rigler, an outstanding limnologist–ecologist who at the time was rethinking his scientific goals. Rigler’s ideas deeply influenced Rob (see Peters 1983*a*) and in 1995 he published a book entitled *Science and Limnology*, originally meant to present Rigler’s unpublished notes and lectures to a larger audience, but in reality an amalgam of their shared ideas for a more effective limnology and ecology.

During his postdoctoral work Rob met his future wife and fellow limnologist, Antonella Cattaneo, and through her acquired a close Italian family as well as a lifelong interest in Italian wines and good food. Parties at Rob and Nella’s were renowned for the quantity and quality of primarily Italian wine and cheeses as well as pasta dishes. Particularly during the earlier years his house was one of the venues for sometimes heated discussions among faculty from the ecology group, and their graduate students, about how ecology is best practiced. These discussions, with Rob in the lead, have had a major influence on how work in limnology (and even evolutionary biology) is carried out at McGill and increasingly elsewhere as well.

Attracting Rob to McGill was a great stroke of good luck. He was an intellectual leader and a senior participant in the Lake Memphermagog Project, which grew into the present Limnology Research Centre. He subsequently played an important role in the successful establishment of the Groupe de recherche interuniversitaire en limnologie et environnement aquatique (GRIL), which unites limnologists from three Montreal universities.

Rob was an honest and delightfully modest man with a self-deprecating sense of humour, totally unaffected by any recognition that came his way. If anything, he minimized his accomplishments and rarely raised his voice. In contrast, as a critic he expressed his ideas in print forcefully, backed by the quantitative evidence he could assemble, about the unnecessary ineffectiveness of fundamental ecology and limnology, followed by proposed solutions to the problems. As he put it in a recent letter, “In my research, I have become obsessed with the inability of Ecology to provide more than the lore of natural history that I enjoyed as a child, or even to recognize the deficiencies. I have therefore set out [with others] to build a predictive ecology as a major contribution to a scientific revolution.” Elsewhere he wrote, “Predictive limnology attracts those who are willing to sacrifice descriptive precision and detail for generality and application in predictions” (Peters 1986).

Rob Peters was deeply concerned about what he saw as (i) the ineffective contribution of academic ecology to the solving of environmental problems, (ii) the attention accorded to untested and frequently untestable notions, including the frequent uncritical acceptance of tautologies (Peters 1976), (iii) the paucity of hypotheses phrased in such a way that the chance that they can be refuted is maximized, and (iv) the only modest interest in predictive success as the ultimate measure of accomplishment.

An important underpinning for the work of many ecologists and biological limnologists is the conviction that it will be possible, in due course, to assemble the large number of components of the ecological pie into a comprehensive and comprehensible picture of the structure and functioning of whole systems. Rob questioned this belief. “Traditionally limnological questions are phrased in terms of the behaviour of individual species under intensive study in the laboratory or a particular water body. Descriptions of this behaviour are often complex, discursive, explanatory idealizations. They frequently transpose badly to other systems because the observed behaviour depends on the specific conditions of observation. Although a coherent view of the whole system might emerge from the aggregate of such studies, evidence in favor of this belief is not encouraging. Instead, success in traditional limnology is achieved by elaborating explanations that are consistent with widely held biological concepts. Thus, traditional

approaches serve to confirm and refine the received view of the external world" (Peters 1986). He then went on to confront the above approach with examples showing the power of a science geared to making useful predictions (Peters 1986).

Not surprisingly, Rob was severely criticized or dismissed by those who felt that he questioned the approach and utility of their work. Nor was his emphasis on the importance of predictive power as the ultimate measure of success much appreciated by those primarily fascinated by the identification of the mechanisms available to species, in causality, or in "understanding." They would question that "predictive power is the touchstone of science, is the ultimate criterion against which every scientific hypothesis can be tested" (Peters 1980b).

The few quotations presented cannot do justice to his extensively elaborated and, where feasible, documented arguments. His 1991 book *A Critique for Ecology* synthesizes his concerns and proposes solutions to what he (and not he alone) perceived to be the impediments that hinder the development of ecology and the contribution it makes both to the advancement of science and the solution of environmental problems.

Rightly or wrongly, most practising scientists pay little attention to the view of philosophers (of science), who often either are not scientists or lack much scientific credibility. Rob's critical views are not so easily dismissed because he was an outstanding limnologist with an international reputation, the author or co-author of about 100 published papers and four books. He had begun work on a fifth book entitled *Predictive Ecology*.

As his first major contribution to a more predictive ecology of greater utility he wrote *The Ecological Implications of Body Size* (Peters 1983b), a widely cited book. He saw the book as a practical and empirical tool to allow ecologists to make at least rough predictions on the basis of body size, in the absence of sufficient information for doing this on the basis of individual species in nature. The use of body size as a predictor was only one of three avenues of research that Rob pursued in his quest for a more useful ecology and limnology. The other two were (i) the utility of phosphorus in allowing predictions to be made about the abundance and distribution of plants and animals in lakes, estuaries, and oceans, and (ii) the possibilities afforded by the structure of organic chemicals for making predictions about their effects on the aquatic biota.

Rob's work is receiving considerable attention. A quantitative measure of this impact is the number of citations to his work by others. These numbered 267 and 293 in 1994 and 1995, an apparently exceptionally high number for ecology and limnology. For more on the use of citations see Peters et al. (1996). His qualities were recognized by the American Society of Limnology and Oceanography, which he served as a member at large at the time of his death, the North American Lake Management Society, for which he was Director of the Central Canadian Region in 1991–1993, and the Society of Canadian Limnologists, of which he was President this year. In 1991 he was awarded the Prize in Limnetic Ecology by the Ecology Institute of Oldendorf, Germany. He was admired, both as a scientist and person, by students and colleagues at McGill University and beyond. He was an excellent and much-liked supervisor of graduate students and an outstanding editor of their publications. His two upper-level courses in predictive ecology and aquatic management nicely complemented the more

traditional offerings available to undergraduates. Rob is greatly missed but his contributions will have a long-term impact on limnology and ecology.¹

Jacob Kalff
Department of Biology
Limnology Research Centre
McGill University
Montreal, QC H3A 1B1

Selected publications

- Cyr, H., and Peters, R.H. 1996. Biomass-size spectra and the prediction of fish biomass in lakes. *Can. J. Fish. Aquat. Sci.* **53**: 994–1006.
- Del Giorgio, P., and Peters, R. 1993. Balance between phytoplankton production and plankton respiration in lakes. *Can. J. Fish. Aquat. Sci.* **50**: 282–289.
- Håkanson, L., and Peters, R.H. 1995. *Predictive limnology*. SPB Academic Publishing, The Hague, The Netherlands.
- Hanson, J.M., and Peters, R.H. 1984. Empirical prediction of zooplankton and profundal macro benthos biomass in lakes. *Can. J. Fish. Aquat. Sci.* **41**: 439–445.
- MacKenzie, B.R., Leggett, W.C., and Peters, R.H. 1990. Estimating larval fish ingestion rates: can laboratory derived values be reliably extrapolated to the wild? *Mar. Ecol. Prog. Ser.* **67**: 209–225.
- Mailhot, H., and Peters, R.H. 1988. Relationships between 1-octanol/water partition coefficient and nine physico-chemical properties. *Environ. Sci. Technol.* **22**: 1479–1488.
- Morin, A., Back, C., Chalifour, A., Boisvert, J., and Peters, R.H. 1988. Effect of black fly ingestion and assimilation on seston transport in a Quebec lake outlet. *Can. J. Fish. Aquat. Sci.* **45**: 705–714.
- Peters, R.H. 1976. Tautology in evolution and ecology. *Am. Nat.* **110**: 1–12.
- Peters, R.H. 1980a. From natural history to ecology. *Perspect. Biol. Med.* **23**: 191–203.
- Peters, R.H. 1980b. Useful concepts for predictive ecology. *Synthese*, **43**: 257–269.
- Peters, R.H. 1983a. Frank Harold Rigler 1928–1982. *Can. J. Fish. Aquat. Sci.* **40**: 252. (Obituary.)
- Peters, R.H. 1983b. *The ecological implications of body size*. Cambridge University Press, Cambridge, U.K.
- Peters, R.H. 1984. Methods for the measurement of feeding, filtering and assimilation rates by zooplankton. *In* IBP Handbook No. 17. 2nd ed. Edited by J.A. Downing and F.H. Rigler. Blackwell Scientific Publications Ltd., Oxford, U.K.
- Peters, R.H. 1986. The role of prediction in limnology. *Limnol. Oceanogr.* **31**: 1143–1159.
- Peters, R.H. 1991. *A critique for ecology*. Cambridge University Press, Cambridge, U.K.
- Peters, R.H., and Downing, J.A. 1984. Empirical analysis of zooplankton filtering and feeding rates. *Limnol. Oceanogr.* **29**: 763–784.
- Peters, R.H., and Raelson, J.V. 1984. Relations between individual size and mammalian population density. *Am. Nat.* **124**: 498–517.
- Peters, R.H., and Rigler, F.H. 1973. Phosphorus release by *Daphnia*. *Limnol. Oceanogr.* **18**: 821–839.

¹ A scholarship fund in Rob's name is being established. Donations, which are tax deductible, can be made out to McGill University – R.H. Peters Scholarship, and forwarded to Kathryn Peterson, Administrative Officer, Department of Biology, McGill University, 1205 Dr. Penfield Avenue, Montreal, QC H3A 1B1, Canada.

- Peters, R.H., and Wassenberg, K. 1983. The effect of size on animal abundance. *Oecologia*, **60**: 89–96.
- Peters, R.H., Ball, G.E., Carignan, R., Hebert, P.D.N., and Prepas, E.E. 1996. An assessment of research in evolution and ecology supported by the Natural Sciences and Engineering Research Council of Canada. *Can. J. Fish. Aquat. Sci.* **53**: 670–680.
- Rigler, F.H., and Peters, R.H. 1995. Science and limnology. Ecology Institute, Oldendorf–Luhe, Germany.
- Shipley, B., and Peters, R.H. 1990. A test of the Tilman model of plant strategies: relative growth rate and biomass partitioning. *Am. Nat.* **136**: 139–153.
- Tang, E., and Peters, R.H. 1995. The allometry of algal respiration. *J. Plankton Res.* **17**: 303–315.