



Obituary: Professor Kenneth Bowler (1934-2019)



It is with very great sadness that we announce the passing of Professor Kenneth Bowler having courageously battled a long illness. Ken was the principal inspiration for establishing the *Journal of Thermal Biology*, and as co-Editor-in-Chief with James Heath from 1974 until he retired in 2013, having served for over 39 years. Through his editorial duties Ken developed continuing relationships with a great many academic colleagues worldwide, which were always constructive and endowed with his profound knowledge of the research field.

Ken had an enormous impact on the development of the field of temperature biology. He founded the *Thermal Biology Group* of the *Society of Experimental Biology* (SEB). The SEB is one of the premier academic societies for comparative physiology of animals, for which he served three times as SEB Council Member and once as SEB Publications Officer (1986-90). Ken also co-authored two biology textbooks: “Principles and Processes in Biology” (1964) with Michael Hollingsworth, and “Temperature Biology of Animals” (1987) with Andrew Cossins, which is still commercially available as a facsimile. Finally, Ken was a Founder member of the *International Association of Astacologists* and the UK representative of the *European Inland Fisheries* advisory working party for freshwater crayfish. In spite of his illness, Ken remained active in research and published a detailed review on the mechanisms of heat death in poikilothermic animals in the *Journal of Thermal Biology* (Bowler 2018). To honour Kens contributions and mentoring, many of his former students and colleagues assembled a special issue in 2015 on the thermal biology of poikilotherms (Terblanche and Overgaard 2015).

Ken enjoyed his early education in the post war years (1947-1954) at King Edward VI School, Lichfield, UK, where he played rugby and excelled at athletics. Subsequently, he studied Zoology at the University of Hull, graduating with a BSc in 1957. This was followed by his Ph.D. (awarded 1961) on the ‘Thermal Physiology of Freshwater Crayfish’ under Jack Grainger but working part-time as an assistant teacher at Hull Grammar School (1960-61), this being in lieu of the obligatory National Service after the war. Here he came under the influence of a fine teacher of biology, Ken Fenton, from whom he learned much about the organisation and delivery of teaching. His first publications arising from his PhD showed that environmental extremes of habitat

temperature caused debilitation and ultimately death in crayfish, due to a breakdown of muscle membranes and the resulting collapse of Na and K ion gradients. He also showed that crayfish could seasonally acclimatise the properties of muscle membranes to ensure survival of the seasonal march of stressful temperatures. His close interest in both the ecology as well as physiology of crayfish continued throughout his working life.

His first academic appointment was as an Assistant Lecturer at St. Bartholomew’s Medical College, a teaching hospital associated with the University of London, where he taught 1st year Medical students. During this time he also completed a MSc degree in Radiation Biology (1961-4) directed by Professor Joe Rotblat, the Nobel prize winner. Here research was initiated along two lines, both in collaboration with colleagues; first, a study of the thermal sensitivity of mammalian spermatogenesis, and secondly a study of the genetics of thermal adaptation in *Drosophila*.

In 1964 he was appointed to a lectureship in Cell Biology in the Department of Zoology, University of Durham, where he remained for his entire career. He was promoted to Professor of Animal Physiology in 1983 and subsequently became Head of an expanded Biosciences Department on two separate occasions (1983-6 and 1993-6). Under his leadership, quality teaching was a key priority, with emphasis placed not only on delivery but also careful programme design. With colleagues he developed a degree in Biomedical Science for which he was course Director, a degree widely recognised as one of the best nationally.

During his time in Durham, he continued to focus on the cellular mechanisms contributing to temperature adaptation in crustaceans, but including crabs as well as freshwater crayfish. In the late 1960s and early 1970s he developed a close working relationship with Chris Duncan, whose idea that membrane permeability was controlled by a MgATPase resonated with Kens interest in temperature adaptation in crayfish. Subsequently, with David Hyde, he applied the novel technique of ‘heterologous acclimation’ to crabs, in which to one side of the animal was exposed to a low temperature and the other to a higher temperature, to show that seasonal adaptations were directed by local tissue temperature rather than by means of a central (i.e. hormonal) control mechanism. With John Anstee he worked on the biochemistry and electrophysiology underlying excretion in insects, and with Ray Manning on manipulating the thermostability of cultured cells. These and other projects were supported throughout by UK Research Councils, The Wellcome Trust, The Leverhulme Foundation, North of England Cancer Research Campaign and the then Ministry of Agriculture, Fisheries and Food.

More recent international collaborations with John Terblanche (Stellenbosch University) have explored the ontogenic changes in

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thermal tolerance in insects, and with Hervé Collinet (University of Louvain) and David Sciaussat (University of Paris) to study the ontogenic changes in chill tolerance in *Drosophila* in relation to responses in heat shock proteins. Professor Bowler's close and long-standing research collaboration with colleagues at Turku University, Finland, culminated in his election as foreign member of the Finnish Academy of Science and Letters in 2000.

Ken's straight-talking style and enthusiasm for biology was an infectious influence both at Durham University and more widely. He was instrumental in shaping the lives and careers of many colleagues and students, for which he was both genuinely caring and who held him in high regard. Chris Gordon, is particularly grateful for Ken's mentoring and guidance when he became co-Editor-in-Chief of the Journal of Thermal Biology.

Throughout his time in Durham until his death Ken was a Fellow and moral tutor of St Cuthberts College, where Hilary, his wife, was for a period of time the Bursar. Together they selflessly supported many students, some through difficult times, as several tributes have attested. Also in the early years they generously provided lodgings in their own home for students, some of whom remained lifelong friends. St Cuths

was also the venue for many convivial dinners with visiting academic colleagues. Ken had two pastimes, firstly, playing squash with friends but also competitively, only stopping in his 70's, and secondly, gardening, to fill his freezer with vegetables for the winter. But, with Hilary, Ken was essentially a family man with two daughters, 4 grandchildren, and the occasional horse, in what remains a very loving family.

References

- Bowler, K., 2018. Heat death in poikilotherms: Is there a common cause? *J Therm Biol.* 76, 77–79.
- Terblanche, J.S., Overgaard, J., 2015. Introduction to the Special Issue "What sets the limit? How thermal limits, performance and preference in ectotherms are influenced by water or energy balance". *J Therm Biol.* 54, 1–2.

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