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Obituary

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John Thornley, who died in December 2023, was a pioneer in applying mathematical modelling and biomathematics to the plant, animal and environmental sciences. Born in Manchester UK, he attended Manchester Grammar School before becoming part of the last cohort of young men to enter national service at the age of 18. He joined the Royal Electrical and Mechanical Engineers (REME) in the British Army for a 2-year period. He thoroughly enjoyed the experience, learning how to handle and repair weapons and radio communications equipment, as well as furthering his knowledge of mathematics and his fluency in German.



John Thornley, 1936–2023

On completing national service, John attended the University of Oxford, having gained a scholarship to Magdalen College. He excelled at Oxford, gaining a first-class degree and the Scott Prize in physics before going on to obtain a doctorate in paramagnetic resonance of coupled systems. He continued working there as a physicist for another 5 years, including spending time as a post-doctoral fellow at St Katherine's College (Oxford, UK) and two spells collaborating with physicists at UC Berkeley in California (USA). Whilst at Oxford, he proposed a structure for ferredoxin, undertaking the crystallography and supporting calculations. This he regarded as his primary scientific achievement.

His career in science took a change of direction towards the end of the 1960s, when he accepted a position with the Agricultural Research Council at the Glasshouse Crops Research Institute in Littlehampton, West Sussex (UK). He began a long and illustrious career as a specialist in mathematical modelling of all aspects of plant physiology. His time at Littlehampton yielded a high volume of journal articles relating to the growth of glasshouse crops, such as tomatoes and cucumbers. He also wrote and published his first book: *Mathematical Models in Plant Physiology*. During this time, he took a sabbatical in Canberra (Australia) to work with scientists at Australia's Commonwealth Scientific and Industrial Research Organisation.

In 1980, John was appointed Head of the Biomathematics Division at the Agricultural Research Council's Grassland Research Institute at Hurley, near Maidenhead (UK). Here, he expanded his research interests beyond plant physiology to the agricultural sciences in general, and several of his most significant scientific projects were undertaken, including the Hurley Pasture Model, a model of grassland dynamics that he developed with colleagues. Over this period, he published numerous journal articles, as well as another book: *Mathematical Models in Agriculture*. Around 1988, John undertook another sabbatical in Australia, this time working at the University of New England in Armidale. Several papers were published and he collaborated on yet another book: *Plant and Crop Modelling: A Mathematical Approach to Plant and Crop Physiology*.

The late 1980s and early 1990s were difficult times for publicly funded agricultural research in the UK, with the restructuring of the research councils. This turn of events was of much concern to John and like-minded opinion leaders, and he took part in many discussions and initiatives (led by Sir Kenneth Blaxter FRS) about what research areas might be spared and how. Unfortunately, such deliberations proved to be unfruitful and most research institute sites in England were eventually closed or merged with Universities.

Following closure of the Hurley site, John took a position at the National Environmental Research Council's Institute of Terrestrial Ecology in Edinburgh (UK), this time developing the Edinburgh Forestry Model. His enthusiasm for exploring and experiencing other countries and cultures led him to one final overseas venture, to New Zealand in 2010 where he spent 6 months as a visiting scientist at Massey University in Palmerston North. John continued his work as a scientist, contributing further articles to scientific journals up until a year or so before his death. He also launched the Henley Schools Environmental Science Competition in 2005, which is now run every year and has proved increasingly popular and relevant.

During the course of his career, he was offered various positions at distinguished centres of learning and research, including Magdalen College (physics don), Queen Mary College in London (UK), Rothamsted Research at Harpenden (UK) and overseas in countries including South Africa, Israel and Colombia. He wrote over 200 journal articles, books and letters, and has currently been cited over 17,000 times. In his private life, John was an avid reader and

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active rambler, cyclist and swimmer. He also enjoyed gardening. He will be keenly missed by his three children, nine grandchildren and many close friends and colleagues.

Selected Publications:

Gibson JE, Hall DO, Thornley JHM and Whatley FR (1966) The iron complex in spinach ferredoxin. *Proceedings of the US National Academy of Sciences* **5**, 987–990.

Thornley JHM (1976) *Mathematical Models in Plant Physiology*. London: Academic Press, 318pp.

Thornley JHM (1998) *Grassland Dynamics: An Ecosystem Simulation Model*. Wallingford, Oxon: CAB International, xii+241pp.

Thornley JHM and Cannell MGR (2000) Managing forests for wood yield and carbon storage: a theoretical study. *Tree Physiology* **20**, 477–485.

Thornley JHM and France J (2007) *Mathematical Models in Agriculture*, revised 2nd Edn. Wallingford, Oxon: CAB International, xvii+906pp.

Thornley JHM and Johnson IR (1990) *Plant and Crop Modelling*. Oxford University Press, 690pp.