



Prof. Sir Thomas Richard Edmund Southwood Emeritus Professor and Vice-Chancellor, University of Oxford



Most important awards, prizes and academies

Awards: Scientific Medal; Zoological Society London (1969); Gold Medal, Linnean Society (1988); Croonian Lecturer, Royal Society (1995). *Academies:* Royal Society (1977); American Academy of Arts and Sciences (1981); Norwegian Academy of Science and Letters (1987); US National Academy of Sciences (1988); Academia Europaea (1989); Pontifical Academy of Sciences (1992); Royal Netherlands Academy of Arts and Sciences (1995); Hungarian Academy of Sciences (1998); Academy of Medical Sciences (1998). *Hon. Fellowships:* (Royal medical colleges) Physicians (1991); Radiologists (1996). *Hon. Degrees* (13): UK (1984, 1994); Australia (1983); Sweden (1986); Canada (1988, 1994). *Civil Honours:* Knight Batchelor, UK (1984); Cavaliere Ufficiale, Order of Merit, Italy (1991); Orden de Merito (II), Portugal (1993); Deputy Lieutenant, Oxfordshire, UK (1993).

Summary of scientific research

The main scientific work of Prof. Southwood falls into two related areas: firstly ecology with a strong bias to entomology and secondly environmental sciences and policy. At the International Congress of Entomology in Vienna in 1960 he presented two papers that outlined new general

concepts. One demonstrated that migration (and active dispersal) in insects was associated with the occupancy of temporary habitats; it was an evolved adaptation to the changing geographical position of the breeding site and not primarily a mechanism for reducing overcrowding. The underlying analysis was an early example of the comparative method and published in *Biological Reviews* in 1962. Subsequently these ideas on the role of habitat characteristics on the evolution of life history strategies were further developed in a series of comparative and analytical studies culminating in the 1977 paper, his Presidential address to the British Ecological Society, 'Habitat, the templet for ecological strategies?', now a citation classic. The general concept propounded there, that suites of life history categories may be related to habitat characters described on two axes, disturbance and productivity (or its converse adversity), has now been applied to a wide range of animal and plant groups. Within this field with colleagues he developed a synoptic model of population dynamics, demonstrating the relative roles of different factors under different conditions, which gave guidance on the strategies for pest control. The second 1960 paper addressed the question of the differing number of species of insects living on different species of trees; he proposed that this was a reflection of the extent, in space and time, of the exposure of the tree pool of potential colonists, drawing a parallel with the development in insects of resistance to insecticides. This theory was substantiated by comparative studies on the entomofauna of trees in many countries including Hawaii, Britain and Russia. It was a particular case and forerunner of the now well established island biogeography theory. This strand of work was taken forward in a number of conceptual and field studies. In 1972 he drew attention to the evolutionary hurdles (obstacles) to the herbivory in insects: nutritional, attachment, desiccation and discovery. Much of his field work has been on insects and birds of farmlands (disturbed habitats) and woodlands. In the early 1960s he showed how modern agricultural methods, by reducing the numbers of weeds in cereal fields and hence the populations of insects, was causing a fall in the survival of young partridges and hence a decline in their population. Much detailed work undertaken by others has confirmed this hypothesis and has led to changes in agricultural practice. A substantial study undertaken in 1977-79 involved the census and identification of all macroscopic organisms on three stages in a secondary succession; this work provided a test of templet and successional theories. Working in the field in a variety of situations and through his teaching he compiled and developed an overview of 'Ecological Methods', published in a book of that title in 1966 which is widely used and remains in print. Through his work in agricultural ecology, Prof. Southwood became involved in what may be broadly described as environmental issues and his publications in this area commenced in 1963 and cover topics such as pesticide use, pollution, energy use, radiation, climate change and sustainable development. As an advisor to the UK Government he played a role in the development of policies on many issues including lead in petrol, acid rain and power station emissions, radiation safety and waste disposal.

Main publications

Southwood, R.E., *Ecological Methods*, London: Methuen, 1966, pp. 392; 2nd edn., 1978; 3rd edn. (with Henderson, P.A.), 2000; Southwood, R.E., *Insects on Plants* (with Strong, D.R. and Lawton,

J.H.), Oxford: Blackwell Scientific Publications, 1984, pp. 313; Southwood, R.E., 'Species richness and resource availability: A phylogenetic analysis of insects associated with trees' (with Kelly, C.K.), *Proc. Natl. Acad. Sci. USA*, 96, pp. 8013-6 (1999); Southwood, R.E., 'National communities: structure and dynamics. The Croonian Lecture 1995', *Phil. Trans. R. Soc. Lond. B.*, 351, pp. 1113-29 (1996); Southwood, R.E., 'Insect-plant relations: overview from the symposium', *Entomologia Experimentalis et Applicata*, 80, pp. 320-4 (1996); Southwood, R.E., 'Ecological Processes and Sustainability', *Int. J. Sustain. Dev. World Ecol.*, 2, pp. 229-39 (1995); Southwood, R.E., 'Risks from radiation: perception and reality. The 1993 Crookshank Lecture of the Royal College of Radiologists', *Clinical Oncology*, 5, pp. 302-8 (1993); Southwood, R.E., 'The Environment: problems and prospects', *Monitoring the Environment*, (B. Cartledge, ed.), pp. 5-41, Oxford: Oxford University Press (1992); Southwood, R.E., 'Surface Waters Acidification Programme: Management Group final report', *Sci. Publ. Affairs*, 5, pp. 74-95 (1990); Southwood, R.E., 'Tactics, strategies and templets', *Oikos*, 52, pp. 3-18 (1988); Southwood, T.R.E., *The Story of Life*, Oxford University Press (2003), pp. xiii+264; Kerr, J.T., Southwood, T.R.E. and Cihlar, J., 'Remotely sensed habitat diversity predicts butterfly species richness and community similarity in Canada', *Proc. Natl. Acad. Sci. USA*, 98, pp. 11365-70 (2001); Sugihara, G., Bersier, L.-F., Southwood, T.R.E., Pimm, S.L. and May, R.M., 'Predicted correspondence between species abundances and dendograms of niche similarities', *Proc. Natl. Acad. Sci USA*, 100, pp. 5246-51 (2003); Southwood, T.R.E., Henderson, P.A. and Woiwod, I.P., 'Stability and change over 67 years - the community of Heteroptera as caught in a light-trap at Rothamsted, UK', *Eur. J. Entomol.*, 100, pp. 557-61 (2003).