# Obituary

# Professor David Stanley Saunders

**12th March 1935 - 22nd April 2023**

David Saunders was born and raised in Pinner, some 15 miles northwest of London, and his pharmacist father had a great interest in insects, particularly butterflies. During the late 1940s and early 1950s, the two would spend time travelling southern England collecting Lepidoptera. At the age of 15 a father-promoted meeting with C.B. Williams, Head of Entomology at Rothamsted Experimental Station (now Rothamsted Research), encouraged David to study hard at school and pursue a university education. So, in 1953 he went to study Zoology at King's College, London University, along with a State Scholarship, awarded for his excellent performances in the final school Botany and Zoology exams.

At King's College David deftly juggled his academic studies with other interests to achieve a first-class degree. At this time David had become interested in the possibilities of using parasitic Hymenoptera as biological control agents so his search for a PhD programme led him to the London School of Tropical Medicine and a project on the eulophid wasp, *Syntomosphyrum glossinae,* a pupal parasitoid of Tsetse Flies. Field-collected Tsetse Fly pupae were mailed to David who found that there were actually two species of wasp emerging, one new to science. He discovered that there was little host specificity shown by these parasitoids and they could not oviposit in buried pupae so were unsuitable as control agents for Tsetse. David also ran a colony of another dipteran pupal parasitoid, *Nasonia vitripennis,* as a comparison, which suddenly stopped breeding as the larvae entered diapause, presumably due to the shortening days of autumn in his roof-top culture. Photoperiodism (the ability to respond to day length, and thus season, in temperate climes) was not new to biology or entomology but this personal observation focussed much of David's research interest for the rest of his life. In 1956, David joined the RES as a Fellow.

David hadn't finished his PhD, when his supervisor encouraged him to apply for an assistant lecturer position at the University of Edinburgh to teach medical and veterinary entomology. He was offered the job, started in 1958 and stayed until retirement in 1999. During that time, David moved from assistant lecturer onwards and upwards to Professor and Head of Department. He was greatly enthused by teaching and research, less so by administration, although colleagues thought him "even-handed in all his dealings".

Over the years, David delved into the mechanisms of photoperiodism, covering the *photoreceptors* required to distinguish light from dark, the *clock* mechanism that measures the duration of light or dark, the *counter* mechanism necessary to accumulate the information from successive light/dark cycles and the *physiology* which finally directs insect development towards diapause in short days or continued development in long days. David was particularly intrigued by how circadian rhythms/oscillations could be involved in time measurement. He, and colleagues, worked mainly with five different insect species from three different orders, switching species to take advantage of size, published background knowledge, to utilise genetic mutants and because David developed an allergy to one of the flies!

Together with Bob Lewis, David managed to pull together two seemingly opposite mechanisms for time measurement – one in which the clock mechanism was based on one or more circadian rhythms and the other in which time was measured in an hourglass fashion. Using theoretical models with oscillators that damped out over time, hourglass-like responses could be predicted. With M.F. Bowen, David removed the brains from tobacco hornworm larvae and exposed them *in vitro* to different daylengths before implanting them into diapause-destined larvae. The larvae developed according to the photoperiod experienced by the isolated brain. Thus, photoreceptors, clock, counter and physiology were all contained in the isolated brain.

Apart from numerous erudite articles, 40 or more post-retirement, David managed to produce three editions of his wonderful book, *Insect Clocks*, across 26 years, each updated to include the most recent findings and essential reading for anyone interested in the topic.

David enjoyed travel, often accompanied by his wife, Jean, and family to conferences and for periods of sabbatical leave to become familiar with techniques that would be useful for his research aspirations and further enlightenment. He was an extremely affable character, so newly-met colleagues soon became friends and willing collaborators.

During his early teens, David developed a life-long passion for cycling and cycle racing. He also enjoyed mountain walking, and rock and alpine climbing during his student days.

David's wife predeceased him by 5 years, and he is survived by their three sons and families. David's fondness and enthusiasm for his subject was not missed by the younger generation and all three sons became professional biologists.

Jim Hardie and Marlies Vaz Nunes