David Alan Walker (1928–2012)

Professor David Alan Walker died after a long illness, on 13 February 2012. He had an extraordinary and fruitful career in photosynthesis that spanned 60 years, starting with his PhD with Meirion Thomas at the University of Newcastle, UK, where he a developed a lifelong fascination with the process of carbon fixation in plants.

He was born in Hull, Yorkshire, England on 18 August 1928. Leaving school in 1946, he entered military service with the Royal Navy as a radar mechanic, leaving him with fond memories and a good grounding in electronics. He returned to education in 1948, talking his bachelor's degree in biology at the Kings College, University of Newcastle, followed by his initial PhD studies.

He then took up a $120-a-month Fulbright Scholarship position with Harry Beevers in Purdue, working on castor beans. Harry's tiny laboratory was located in the 'Pierce Conservatory and Small Animal House' that lacked air conditioning, a severe impediment to work employing Warburg respirometers. He later wrote that "Harry was the best thing that could happen to an apprentice scientist". At that stage, he was isolating intact mitochondria, whose function was more rapid by a couple of orders of magnitude than any isolated previously.

Fortified by his experience in Beevers's laboratory, he returned to the UK in 1954 to complete his PhD in dark acidification in CAM plants. Robin Hill was his external examiner for his PhD. This first, rather fierce, encounter with Robin fired a lifetime collaboration and friendship between these two giants of photosynthesis research. He then took up a fellowship with Robin in an even smaller laboratory in Cambridge, working on photophosphorylation contemporaneously with Doug Graham, Dan Arnon and Bob Whatley, and with Frederick Sanger across the corridor. He was particularly impressed to be asked to give a lecture in the Botany School by F.F. Blackman. In 1958, he met Charles Whittingham, who offered him a lectureship at Queen Mary College in the University of London. It was here that he met Tom Delieu, an exceptionally talented technician, and he supervised his first PhD student, Geoffrey Hind. With Whittingham, he started his pioneering work on the importance of chloroplast as an intact organelle and moved with him to Imperial College in the University of London, where he was appointed a Reader.

He always reflected on this period at Imperial as a 'Golden Age', of hard work, scientific achievement and enjoyment in a team with his colleagues, Carl Baldry, Chris Bucke and Bill Cockburn, during which the isolation of intact chloroplasts fixing CO_2 at rates equivalent to those in intact leaves became a reality. Robin Hill introduced him to the Clark oxygen electrode, enabling CO_2-dependent oxygen evolution by intact chloroplasts to be measured directly. In 1970, Hans Heldt visited Imperial, and they discussed transport across the chloroplast envelope membranes whereupon the exciting concept of the phosphate translocator was formulated. The charms of London in the 1960s were somewhat diminished by a daily four hour commute to and from Essex and he snatched the opportunity of returning to the North of England by taking up the Chair in Experimental Biology at the University of Sheffield in 1970.

His contribution to photosynthesis was recognized by his election to the Royal Society in 1979, and with funding from the UK Agricultural and Food Research Council, he founded the Robert Hill Institute (RHI) in 1984, a purpose-built photosynthesis laboratory with greenhouse space in the university botanic gardens. By creating a stimulating and dynamic research environment, international collaborations flourished with similar-minded researchers from nearly every corner of the globe, particularly from Germany, Australia and the USA. Visitors flocked to the RHI. Working together with Tom Delieu, who had also moved to Sheffield, he developed the first prototype oxygen electrodes. The development and commercialization of equipment became a cornerstone of the RHI, alongside systems for the simultaneous measurement of photosynthesis gas exchange, chlorophyll fluorescence and other key parameters, including the leaf disc oxygen electrode. Equipment development was something that suited his perfectionist streak.

David truly believed that knowledge was a precious gift to be shared and enjoyed. By his own admission, lecturing filled David with horror, but paradoxically he revelled in the process of educating others about photosynthesis. David actively promoted science education through all avenues from books and electronic media, including C_3, C_4 with Gerry Edwards, *Energy, Plants and Man*, amply illustrated by his son's cartoons, and *A Leaf in Time*, and he even devised a scientific quiz printed on pub beer mats, to spur the interest of the ordinary man. He greatly enjoyed the International Training Courses on Photosynthesis organized by David Hall. Strangely, for someone who delighted in technical innovation, he remained exasperated by having to use chopsticks continuously for three weeks during one of those courses in China in 1985. In 2004, he was awarded the inaugural ISPR Communications Award to acknowledge outstanding efforts to communicate photosynthesis to the general public and in 2006 was awarded an Honorary Doctorate of Letters by the University of Sheffield. Most recently, he was actively criticizing some of the extravagant claims made for algal productivity.

David loved literature, poetry, singing the local carols and activities that enabled him to communicate his love of science. As Ulrich Heber wrote on the day of his death, we had "lost not only a marvellous friend, but also a hero of photosynthesis research". David leaves behind his beloved wife Shirley, his companion for 55 years, his daughter Marney and son Richard, and the enduring legacy of a life well lived. ■

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