

## *In Memoriam*

### Vincent Roy Switsur

1929–2014



Roy Switsur died peacefully on the 5th of November 2014 at the age of 85. He was a man of great intellectual ability and breadth of knowledge, qualities that were apparent both inside and outside the laboratory. His main scientific pursuits were in the fields of radiocarbon dating – he was one of the pioneers of the technique in the UK – and, over the latter period of his career, dendrochronology and isotopic dendroclimatology.

Roy was born on the 12th May, 1929, in Dordon in the county of Warwickshire in the English Midlands. He attended the Queen Elizabeth's Grammar School in nearby Atherstone. After two years National Service, he studied chemistry at the University of Birmingham, where he gained his BSc in 1953. This was followed by two years in industry, working for the chemical company Reckitt and Colman. His research career began at the University of Sheffield, where he completed his PhD in 1958. That year he also began his career at the University of Cambridge when he joined the Electron Microscope Group in the Cavendish Laboratory. He carried out research on electron optics, and designed and constructed a scanning electron probe X-ray

micro-analyzer for organic specimens, which he applied to the study of dental tissue.

In 1964 Roy was appointed as Senior Assistant in Research to take over the Radiocarbon Dating Laboratory from Eric Willis in the Sub-Department of Quaternary Research in the University, where he remained until he retired. In 1968 he was promoted to Assistant Director of Research. One of his initial tasks on joining the Sub-Department was to update the rapidly aging equipment in the laboratory, which involved extensive reorganization and rebuilding of the facilities. Old valve-based systems were replaced with transistorized circuits, and a massive lead cosmic ray shield for the gas proportional counters was constructed. The shield weighed several tonnes, and a suitable source of the required low-activity lead turned out to be the roof of nearby St. John's College. The result of the modifications was a facility that had the capability of producing the most precise radiocarbon dates in the UK at that time. Roy's innovative mind was, however, never satisfied with the *status quo*, and throughout his time as Director of the Radiocarbon Dating Laboratory he continued to improve

and refine the apparatus and preparative processes. A major impetus for improvements was provided in 1977 by the move of the Radiocarbon Dating Laboratory a short distance from its original home near the railway station into the centre of Cambridge, to the newly named Godwin Laboratory. Roy used the opportunities provided to begin the replacement of the proportional counters with the more convenient liquid scintillation counters. The new technique required many changes in sample preparation in order to synthesize, via the intermediacy of acetylene, the benzene that was used in the scintillation counters. Roy was instrumental in making many improvements to the standard techniques. In particular he invented a novel reactor for the combustion of samples containing low levels of carbon, and he completely redesigned the lithium furnace for the production of lithium carbide from carbon dioxide. His apparatus allowed this conversion to be carried out at much lower temperatures than was previously possible, making the process considerably safer.

During Roy's stewardship, the Radiocarbon Dating Laboratory produced several thousand dates for colleagues and collaborative projects around the world. Roy's research interests were wide. Particularly worthy of mention are several of his collaborations. His dating of Mayan archaeology, with Norman Hammond, produced dates for the Mayan formative period in the Yucatan Peninsula some 1700 years earlier than previously thought. With Roger Jacobi he conducted a project on Mesolithic sites in England and Wales, which combined analysis of lithic typology with radiocarbon dates and led to a re-assessment of the Mesolithic period in Britain. His long-term project with Allen Hibbert provided a detailed chronological background for the vegetational history of the Flandrian in the UK.

A particular interest of Roy's was prehistoric boats, which have been found in waterlogged conditions in several places in the UK. Collaboration with Sean McGrail of the National Maritime Museum resulted in an influential report on early British boats and their chronology. It was the problems caused to the dating process by previously applied preservation treatments that led Roy to a major new research interest: dendrochronology.

Work in this area began in 1976 with collection of samples of bog oaks from across the fenlands of East Anglia, with the aim of producing a ring width chronology for this part of Eastern England, and fitting it to chronologies from other parts of the country, a project later realized by colleagues at Queen's University, Belfast. Together with Tony Carter and colleagues, Roy led the development of a network of modern and historical chronologies across Cambridgeshire. In the early 1980s Roy's dendrochronological interests extended into the study of stable isotopes in tree rings, in order more fully to extract the palaeoclimatic information recorded therein. Over the next two decades a succession of awards from UK and European funding agencies enabled him to establish and maintain a thriving and productive team of research students, research assistants and colleagues. Several of his former students have themselves gone on to establish their own successful research careers elsewhere. Early work, especially in the measurement of oxygen and hydrogen isotope ratios, provided valuable proof-of-concept for the isotope technique, but was hindered by the lengthy processes involved. This problem limited studies to single trees over the timescale of around 100 years. However, continuing improvements in techniques – some of which were developed by Roy's group – resulted in much faster processing speeds. This enabled replication at annual resolution using growth rings from multiple trees, resulting in century-long isotope time-series in a network of sites around the UK and in southern Finland. The success of this work was rooted in Roy's patient, careful and thorough approach to research as well as his attention to detail and enthusiasm to explore new ideas. This work culminated in the production of 400-year time-series of carbon and oxygen stable isotope ratios from several sites across Britain. The data obtained by the group resulted in a greater understanding of climate-isotope relationships, biochemical processes within trees (including physiological feedbacks), and the effects of sulphur dioxide and carbon dioxide on isotopic processes within trees.

Outside the laboratory Roy was a Fellow, later Emeritus Fellow, of Wolfson College,

Cambridge. He wrote poetry and was particularly fond of cricket, and often attended Test Matches and other first class matches around the country.

Despite declining health over his last few years, Roy's intellectual sharpness remained until the end. He leaves two sons, a daughter and four

grandchildren. Among his former colleagues and research students he will be remembered for his inspiring supervision, great generosity of spirit and a refreshingly idiosyncratic sense of humour.

—Contributed by *John Waterhouse, Iain Robertson,  
Neil Loader*