

## Louis Isaac Woolf (24 April 1919 – 7 February 2021)



Professor Emeritus Louis Woolf died aged 101 on Sunday, 7 February 2021, in Vancouver, British Columbia. He is best known for his pioneering work conceiving and developing the first dietary treatment for phenylketonuria (PKU) based on a phenylalanine – a depleted hydrolysate of milk protein. His idea came from a ‘light bulb’ moment at a biochemistry meeting.

Louis joined the Biochemical Society in May 1949 and continued until his death. He was thereby one of the longest ever serving members of the Society.

He was born in London, the third child of Jewish parents from northern Romania. In 1938 he gained scholarships to study for a degree in chemistry at University College London (UCL) achieving First Class Honours and then a PhD. In 1939, at the outbreak of World War II, he was evacuated to Aberystwyth in Wales, along with the rest of UCL, to complete his degrees. There he met his future wife Frances Mary Richards.

In 1947 he secured a post at Great Ormond Street Hospital (GOSH) to research tyrosine metabolism in premature babies. His first publication in a 1950 issue of the *Biochemical Journal* described this. Included in his chromatography studies were patients with PKU, then considered ‘untreatable’. He had postulated that their severe learning difficulties arose either from their abnormally raised blood phenylalanine concentrations or its toxic metabolite phenylacetic acid. He presented his investigations on the latter at the 1951 Biochemical Society Annual General Meeting in London. He wondered, could PKU patients be treated by lowering their concentration of phenylalanine with an artificial, low phenylalanine diet with added nutrients to make it a complete food? A protein substitute of pure amino acids was then extremely expensive. Fortuitously he went to a Biochemical Society meeting at which an economical growth medium for the microbiological assay of amino acids in protein was described. Phenylalanine and aromatic amino acids were removed from an acid hydrolysate of protein by filtration through charcoal. Louis knew that an acid hydrolysate of the milk protein, casein, was available from Allen and Hanbury, where he had worked, and could provide the basis for his dietary concept. Louis was unable to persuade paediatricians at GOSH to trial this. More receptive was a German paediatrician, Horst Bickel, visiting from his post in Birmingham, who enquired whether Louis could think of a way to treat PKU. Whilst sceptical of Louis’ idea, Bickel successfully treated a 2-year-old girl with PKU in Birmingham utilizing Louis’ method for producing

a liquid food low in phenylalanine content. This was a world first and a lasting legacy.

Louis moved to Oxford in 1958 to continue research into PKU. It is less well known that, since his time at GOSH, Louis had been convinced that newborn screening for PKU would improve outcomes by enabling earlier dietary therapy. Urine testing was a simple and non-invasive way and he and Senior Medical Officer in Public Health, Dr Nancy Gibbs, trialled a urine screening programme aimed at detecting all cases of PKU in a cohort of babies in Cardiff, Wales, from 1958 to 1959 – another world first which was partially successful. By 1968, with experience from other trials in other UK countries, it was apparent that urine detection in newborns was insufficiently reliable and blood analysis became the recommendation with the heel prick test we are now so familiar with.

Louis’ published work and presentations had become known internationally. In 1968 Dr William Gibson offered him a post as associate professor at the University of British Columbia (UBC). He was promoted to professor 6 years later in 1974. He published extensively, with over 120 papers to his name, a book on renal tubular dysfunction and contributions to books, conferences and supervision of many research students. He retired in 1984 after a 16-year teaching and research career at UBC.

A shy and modest man, he was devoted to his family. His wife Frances died in 1991 and Louis is survived by his only daughter Lesley, grandsons Benjamin and Oliver, two great-grandchildren, Graham and Willow, and his youngest brother, Henry. He was beautifully spoken in a refined, old-fashioned British way with an astonishing memory to the end. Generous to people who criticized him, he quietly stood his ground, recognizing that valid debate is integral to scientific discovery. And – like many another innovative scientist – it is in this way that he triumphed over sceptical adversity to leave a legacy in pioneering the successful treatment of PKU.



**Kate Hall** (International Society for Neonatal Screening)