Mair, (William) Austyn (1917-2008), aeronautical engineer, was born on 24 February 1917 at Viewfield, Banstead Road, Cuddington, Surrey, the younger son and youngest of three children of William Mair (1875-1969), medical practitioner, and his wife Catharine Millicent, née Fyfe (1881-1965). Both his parents were Scottish. They had moved to London shortly before he was born, a move which later disappointed Mair, who regretted not being 'a proper Scotsman' (personal knowledge). His paternal grandfather, James Mair, was a clergyman, and his maternal grandfather, James Sloane Fyfe, was a merchant. At birth Mair's forenames were registered as William Dyce, but a month later, on 23 March 1917, his mother's brother, Austyn Fyfe, a lieutenant in the 1st (Highland) Brigade, Royal Field Artillery, was killed in Belgium, aged forty. Brother and sister were close, and, in memory of her brother, Mair's mother arranged to change her son's name to William Austyn. Thereafter and throughout his adult life he was known simply as Austyn.

Mair's secondary education was at Highgate School in north London, from where he went in 1936 to Clare College, Cambridge, to read Mechanical Sciences, which at that time embraced topics across the broad field of civil, mechanical, and electrical engineering. He graduated in 1939 with first class honours and was awarded the university's Rex Moir Prize for the top student of his year. While an undergraduate, he was impressed with the new subject of aeronautics, then being taught by Melvill Jones. On graduating, he became an engineering pupil in the Experimental Department of Rolls-Royce at Derby.

Mair's time with Rolls-Royce was short. On the outbreak of the Second World War, he volunteered for the RAF and was directed to the Royal Aircraft Establishment at Farnborough to join secret research on high-speed flight. He was commissioned as a Flight

Lieutenant in the Volunteer Reserve. The focus at Farnborough was on increasing the speed of fighter aircraft, but it was not known how fragile aircraft structures would respond to air turbulence as their speed increased past known limits. At Farnborough, research followed two separate paths. One was to test stationary aircraft in a high-speed wind tunnel, where air would be blown past the aircraft at increasingly high speeds. The other was to test operational aircraft by diving from great height to gather as much speed as possible. Mair was involved in both.

Construction of Farnborough's high-speed wind tunnel had begun in 1938, but it was not completed until 1942. Mair arrived in time to help with building the tunnel and he played a major part in setting up the necessary measuring instruments. In parallel, Spitfire aircraft were flight tested at probably the highest speeds that had ever been recorded for an aircraft anywhere in the world. It was possible that violent buffeting would make an aircraft uncontrollable, or that a pilot might not be able to pull out from a high-speed dive. Mair was not a test pilot, but he regularly flew as an observer in Farnborough's test aircraft.

During this time, Frank Whittle was working on the development of jet engines and this led to the first operational jet fighter, the Meteor, which made its inaugural flight in March 1943. It suffered from serious instability problems at high speed and there were a number of crashes. Mair's work traced the problem to irregular flow round the plane's jet-engine nacelles, and solved it by increasing the length of the nacelles to smooth airflow. This modification was incorporated in all future aircraft and, in 1946, the Meteor achieved a world record speed of over 600 mph.

At the end of the war, when Mair had been demobilised with the rank of Squadron Leader, he was entrusted with editing the Royal Aircraft Establishment's monograph describing all its wartime research. The monograph ran to 150 closely printed pages, with almost 200 diagrams and photographs. It established Mair's professional reputation. Within months he had been appointed to a Readership in High-speed Fluid Mechanics at Manchester University with the remit to establish a Fluid Motion Laboratory. Obtaining the necessary resources to start a new laboratory from scratch in the immediate postwar years was difficult, but by 1952 aerodynamic research at Manchester was becoming established for the first time. Then there was an unexpected development. Jones, Cambridge's first Professor of Aeronautics, retired. Although there were other, more experienced candidates, and although only thirty-five, Mair had a substantial reputation. He was elected to the Francis Mond Professorship of Aeronautical Engineering in time for the start of the Michaelmas term in 1952.

Jones had concentrated on flight testing at the nearby RAF base at Duxford, and laboratory facilities in Cambridge were meagre. They consisted of just three small wind tunnels in a wooden shed. But the emphasis of research was now moving to precision experiments under carefully-controlled laboratory conditions. Fortunately Mair arrived at an opportune time at Cambridge because the University Grants Committee agreed shortly afterwards to extend the recently-built engineering building. This allowed two large wind tunnels to be constructed. They were operational by the early 1960s.

For the next ten years, with his laboratories completed, Mair concentrated on teaching and research in all branches of flight and industrial aerodynamics. Gradually his interests

changed from high-speed flight to aircraft that could take off and land vertically, and to hovercraft. He worked with Christopher Cockerell on hovercraft, leading to Mair's paper to the Royal Aeronautical Society in 1964 on 'The Physical Principles of Hovercraft'. He became chairman of the Powered Lift Committee of the Aeronautical Research Council at a time when there was huge interest in the development of aircraft for vertical flight and short take-off and landing (STOL), and in 1966 he delivered the ninth Lanchester Memorial Lecture to the Royal Aeronautical Society on the subject 'STOL – Some Possibilities and Limitations'. He had been awarded the Society's Orville Wright Prize in 1953 and its Silver Medal in 1975. He was appointed CBE for services to the aeronautical profession in 1969.

In 1973 Mair became Head of the Cambridge University Engineering Department, where he served for two full terms until close to retirement in 1983. It was a time when major curriculum developments began. During his headship, a new Production Engineering Tripos was introduced for undergraduates, and the one-year Advanced Course in Production Methods and Management for graduate students was much improved. It was the start of major developments in teaching that brought together engineering science with policy and management topics that had previously been marginalised. The pace of change increased when the influential Finniston Report came out in 1979. It recommended that all engineering courses should last for four years and all four-year students should receive MEng degrees. These recommendations brought particular challenges for Cambridge. Undergraduate admissions were decided by colleges, not by the engineering department, and it was not clear how additional teaching resources could be provided. It was the start of a long process of negotiation that continued after Mair's retirement, but the groundwork began when he was in office and his calm consultative approach laid the foundation for a

complete update of the curriculum, now unrecognisable from the Mechanical Sciences Tripos that existed when he was appointed in 1952.

Mair was elected to a Professorial Fellowship at Downing College in 1953 and remained a fellow until his death, for some years serving as Vice-Master. He was a Fellow of the Royal Academy of Engineering (elected in 1984) and of the Royal Aeronautical Society. After his retirement, Cranfield University awarded him an honorary DSc (1990) and he published his book *Aircraft Performance* (written jointly with D. L. Birdsall) in 1992.

Austyn Mair was happily married for sixty-four years to Mary Woodhouse Crofts (1916-2011). The daughter of a vicar, Christopher Benson Crofts, she was a Red Cross nurse from Cornwall who was nursing at his father's hospital in Surrey. They met at his parents' house and were married at St. Mark's, Hamilton Terrace, London, on 15 April 1944. They had two sons, Christopher (b. 1945) and Robert (b. 1950). She supported Mair faithfully throughout his career. In old age, he became a victim of Parkinson's disease and for many years was cared for at the Hope Nursing Home in Cambridge. Towards the end, she moved voluntarily into the same nursing home to be near him. He died there from complications of Parkinson's disease on 17 January 2008. A memorial service was held in Downing College Chapel on 1 March 2008. His son Robert followed him into engineering, becoming Sir Kirby Laing Professor of Civil Engineering at Cambridge, Master of Jesus College from 2001 to 2011, and a life peer in 2015.

D E Newland

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