

# Melvin Glimcher

Human bones researcher, gait expert, and prosthetics innovator

**Melvin Glimcher (b 1925; q Harvard Medical School 1950), had been in failing health and died at home on 12 May 2014.**

A barren field, wide open for scientific discovery. That is how one of Melvin Glimcher's professors at Harvard Medical School described the specialty of orthopaedic surgery to him. So after Glimcher earned his medical degree in 1950, he trained for three years in general surgery at Massachusetts General Hospital, and then completed further training in orthopaedic surgery.

In 1956, still in training as a chief resident, Glimcher had become fascinated with the structure of human bones and felt he needed much deeper scientific knowledge before he could hope to uncover their secrets. He started what would be four years of advanced study in biochemistry, biophysics, and engineering as a research fellow at the nearby Massachusetts Institute of Technology (MIT).

In 1957, only one year into his studies at MIT, he was lead author of a paper in *Proceedings of the National Academy of Sciences of the USA* that described the role of the long chain protein collagen in the calcification of bones.<sup>1</sup> The paper—which is still being cited—was the first of many groundbreaking papers by Glimcher that examine the composition of bone and, later, tooth enamel.

Glimcher, who was professor emeritus at Harvard Medical School at the time of his death, authored nearly 400 papers during half a century of research, gaining worldwide recognition for his work on the biophysics of bone. His contributions to structural biology included discoveries of proteins important to the formation of bone structure, and the most detailed description of the molecular architecture of this central substance.

## Fascination with human bones

Arnold I Caplan, director of the skeletal research centre at Case Western Reserve University in Cleveland, Ohio, calls Glimcher “one of my scientific and medical heroes,” adding: “He had an uncanny and innate understanding of bone and its dynamic properties, and many of his studies and publications document his intuitively innovative views.” Caplan says that over the years “every time I had a ‘new’ scientific finding related to biological mineralisation of bone, Glimcher—in an earlier publication—had already proposed that biomaterialisation would, indeed, proceed as I had ‘newly’ discovered it.”

In an interview with the *New York Times* in 1988, Glimcher talked of his fascination with



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human bones: “Nature has evolved this magnificent substance. It has mechanical properties just beautifully designed to do the job, to carry you around.”<sup>2</sup>

In addition to his work on bones and other hard tissues, Glimcher also contributed to a better understanding of human gait, and was a leading orthopaedic surgeon in the rehabilitation of patients with lost limbs and multiple broken bones.

In the 1960s Glimcher was a driving force in the development of the so called Boston arm (also known as the Boston elbow), an artificial myoelectric arm whose electrodes could detect electrical charges from the contraction of the stump muscle.

According to a case study of the Boston elbow published in 1984 by the US Office of Technology,<sup>3</sup> Glimcher had observed a myoelectric hand prosthesis on a trip to the former Soviet Union. In 1961 he discussed the hand prosthesis with a patient at Massachusetts General Hospital, whom he was treating for a broken hip. The patient was the renowned MIT mathematician Norbert Wiener, who liked the idea and encouraged Glimcher to proceed, putting him in contact with two MIT engineers who could help. The Boston elbow was announced to the public in 1968, and several

hundred were sold in the following years. Aspects of its design and mechanics were later incorporated into other prostheses.

## Mechanical engineering and physics

Melvin Jacob Glimcher was born on 2 June 1925 in Brookline, Massachusetts, part of greater Boston, and grew up in nearby Chelsea. His family owned and managed a garment factory. During the second world war he joined the US Marine Corps, which assigned him to study mechanical engineering at Purdue University in West Lafayette, Indiana. He added physics to his programme, graduating with degrees in both in 1946.

In his second year at Harvard Medical School, while doing research for a report on the mechanics of the foot, he decided that technical details in textbooks were wrong, Glimcher recalled in the 1988 *New York Times* interview. He included this in his report, but faculty members did not believe him and asked engineering faculty members for an opinion. The engineers ruled in favour of Glimcher.

In 1959 Glimcher was named assistant professor of orthopaedic surgery at Harvard, and in the mid-1960s became the first person to hold a tenured orthopaedic surgery chair at Harvard. He served as chief of orthopaedic surgery at Massachusetts General Hospital and at Boston Children's Hospital.

“His laboratory at Harvard not only gave birth to unique discoveries,” says Caplan, “but it also housed the development of some of the most innovative and productive scientists and physician-scientists.” One of those was Glimcher's daughter, Laurie Glimcher, who is now dean of Weill Cornell Medical College in New York City. As a child she often visited her father's lab and went on to follow in his footsteps at Harvard, becoming a leading immunologist there.<sup>4</sup> Father and daughter collaborated on several research papers, including one published in *Science* in 2006 about a mechanism that regulates bone growth.<sup>5</sup>

Laurie Glimcher says of her father: “He was never content to continue to do ‘me too’ experiments but rather sought to break open new fields and make transformative breakthroughs. This required taking big risks and tolerating big failures, but he was driven by a passion to innovate and to discover. He loved solving difficult puzzles.”

Glimcher's two marriages ended in divorce. He leaves three daughters.

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References are in the version on thebmj.com.

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**Gary Brierley Hughes**



**General practitioner (b 1953; q Royal Free Hospital, London, 1977; MRCS, MRCGP), d 15 November 2013.**

After qualifying in London, Gary Brierley Hughes ("Tiger") moved back home to Cornwall for his house jobs, followed by training in general practice. He joined Clinton Road Surgery in Redruth in 1982 and soon became an integral part of the practice and the community. He stayed there for his entire GP career, subspecialising in family planning and becoming senior partner in 2006. An avid rugby fan, he also spent time providing medical cover for the Cornish rugby team. Later in his career he became an honorary lecturer for the recently formed Peninsula Medical School. A passionate sailor, he was a member of both the Royal Cornwall Yacht Club and Flushing Sailing Club, regularly competing in national championships. He leaves two sons, Mark (who followed him into medicine) and Sam.

**Mark Hughes**

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**Colin Hemming**



**Former general practitioner partner in Blaenavon, South Wales (b 1931; q Bristol 1957), died from a brain tumour on 7 May 2014.**

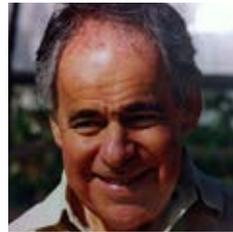
Colin Hemming was a captain in the Royal Army Medical Corps until 1959. He worked as a medical registrar in Greenwich between 1960 and 1964 and then as a medical officer at the student health service

in Bristol from 1964 to 1969. He became a GP partner in Blaenavon in 1969, but in 1979 the difficulty of undertaking night visits while experiencing increasing problems with rheumatoid arthritis prompted him to move to a role in occupational health. He worked with Gwent Health Authority until his final retirement in 1989. Colin Hemming leaves his wife, Aileen; and two children, Michael and Sharon.

**W Lewis**

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**Robert Samuel Hornung**



**Former consultant cardiologist University Hospital Aintree (b 1948; q St George's Hospital, London, 1975; FRCP), d 5 April 2014.**

Robert Samuel Hornung obtained a degree in physiology at London University before deciding to study medicine. He was appointed as the second consultant cardiologist at the Aintree Cardiac Centre in 1990. He made a major contribution to the development and provision of the full range of cardiac services at the centre, and he also undertook invasive diagnostic cardiac catheterisation at the Liverpool Heart and Chest Hospital and established permanent pacing at Aintree. He retired from Aintree in 2008 but continued to work part time at Arrowse Park Hospital and the Wirral Heart Centre. Throughout his life, he was an avid follower of rugby and a keen guitarist. He leaves Liz, his wife of 41 years; two sons; and two grandchildren.

**EA Hornung**

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**George P McNicol**

**Professor of medicine (b 1929; q Glasgow 1952; CBE, FRFPs Glas, FRCP Ed, FRCP Glas, PhD Glas, MD, FRCPATH, FRCP Lond, Hon FACP), d 28 July 2014.**



George P McNicol's work in pathology was based in universities and hospitals in Scotland. In addition, he took overseas posts as lecturer, consultant, and visiting professor at universities and hospitals in Kenya, Egypt, New Zealand, and the US. He was editor of the *Scottish Medical Journal* for three years and accepted numerous honorary administrative appointments. From 1981 to 1991, he took up the post of principal and vice chancellor of the University of Aberdeen and later became the joint president of the European Union Standing Committee on medical training in 1989-92. After retiring, he moved to the Black Isle in Scotland and then to a new home in France. George leaves his wife, Susan; three children; and four grandchildren.

**Sue McNicol**

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**Desmond Lorne Marcus McNeill**



**Consultant psychiatrist Horton Hospital, Epsom (b 1920; q King's College Hospital 1948), d 22 December 2013.**

Desmond Lorne Marcus McNeill developed diabetes at the age of 5 in 1926 while on a family skiing holiday in Switzerland and was first treated there with insulin. Initially he went up to Oxford to read biochemistry, but he changed to medicine. He eventually trained in psychiatry, and his particular interests were schizophrenia and post-traumatic stress disorder. In 1973 he was stabbed by a patient whom he had treated at Horton previously. In spite of a perforated bowel and numerous stab wounds he survived

and went back to practice after six months. He was treated with insulin for 88 years and escaped all of the major common complications of diabetes. Predeceased by his wife, Hazel Wootton, he leaves a daughter; twin grandchildren; and a son in law.

**Sandra Hurst, Geoffrey Robb**

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**Leonard Charles Wolfman**



**Former general practitioner Liverpool (b 1924; q Liverpool 1947), d 22 July 2014.**

Leonard Charles Wolfman ("Len") was a singlehanded general practitioner in Toxteth for many years and was in the news for holding his surgery on the pavement after the riots. In 1947 he was in the Royal Army Medical Corps in Libya and Suez and worked as a ship's doctor for the Elder Dempster Lines shipping company, going from Liverpool to west Africa. He also worked as a psychiatrist in Sefton General Hospital and in drug addiction rehabilitation at a pioneering clinic in Hope Street. A devoted Liverpool FC supporter he was present with his son Stuart at the Hillsborough disaster. He was also a single figure golfer and serious bridge player. He leaves Shirley, his wife of 63 years; two sons; and a daughter.

**Shirley Wolfman, Stuart Wolfman,**

**Michael Wolfman**

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