

Robert Edwards

(1925–2013)

Pioneer of *in vitro* fertilization.

Several scientists have made discoveries that have saved millions of lives. Robert Edwards helped to create them.

Edwards, who died on 10 April, was born in 1925 in Batley, UK, a West Yorkshire mill town, and educated in Manchester. He studied agriculture and zoology at the University of Wales, in Bangor, UK, after nearly four years of military service. In 1951, he graduated with only a pass. Despite this inauspicious start, his friend John Slee remembered much later that Edwards had been “ambitious and flexible, and unusually confident in his own judgement”.

Soon after Edwards had enrolled at the University of Edinburgh, UK, to pursue a diploma in animal genetics, his professor, Conrad Waddington, offered him a PhD studentship and later a fellowship. At Edinburgh, in collaboration with fellow graduate student Ruth Fowler (Edwards’ future wife and granddaughter of the eminent physicist Ernest Rutherford) Edwards established how to manipulate ovulation in mice. Six years on, with a bundle of research papers, including several of the many that would be published in *Nature*, Edwards was becoming someone to watch.

After a brief spell at the California Institute of Technology in Pasadena, Edwards was recruited by physiologist Alan Parkes to the Medical Research Council (MRC) National Institute for Medical Research (NIMR) in Mill Hill, London, to help develop vaccines as contraceptives for women. In his spare time, Edwards returned to the study of eggs, primarily wanting to understand the basis of chromosomal abnormalities, as well as what causes eggs to ripen — a necessary first step to achieving *in vitro* fertilization, or IVF.

In the early 1960s, a new NIMR director banned research on human IVF. Following this discouragement, in 1963 Edwards joined Parkes, who had moved to the Physiological Laboratory at the University of Cambridge, UK. Edwards remained at the university for the rest of his life.

At Cambridge, Edwards’ team — which I joined as a PhD student in 1970 — focused on early mammalian development. In a 1965 *Lancet* paper, Edwards had outlined a breathtaking programme for studying the genetics and development of eggs by fertilizing them *in vitro*. To obtain eggs, he needed to collaborate with physicians, the gatekeepers to patients, but his ‘harebrained’ agenda made them wary.



At a now legendary meeting at the Royal Society of Medicine in London, he found the ideal partner. Patrick Steptoe, a senior gynaecologist from Oldham, UK, had completed pioneering work on laparoscopy. Derided by colleagues in gynaecology, this was a surgical technique that Edwards needed to collect eggs from patients. Both men wanted to conquer infertility and both had experienced professional controversy. Their relationship prospered, helped by Jean Purdy, a nurse who was trained by Edwards as a lab technician.

Edwards, Steptoe and a student reported the first convincing evidence of human fertilization *in vitro* in 1969. The clinical implications of the breakthrough predicted by Edwards could no longer be dismissed as pie in the sky. Media attention reached new heights, and a bitter tide of criticism flooded in from scientists, physicians and politicians.

After the MRC declined Edwards’ and Steptoe’s grant application, ostensibly because of concerns about safety, their programme continued to be stretched between Oldham and Cambridge on a shoestring budget. There were still so many unanswered questions. Would fertility drugs be needed? Would the resulting embryos be healthy? Edwards and Steptoe laboured for nearly a decade without a viable pregnancy, but in 1978, Louise Brown, the world’s first ‘test-tube’ baby was born. After her birth, most of the hostility vaporized; it seemed heartless to say that a bonny IVF baby should never have been born. There are now more than five million such babies, many of whom are parents themselves.

In 1980, Edwards and Steptoe founded a private fertility clinic at Bourn Hall, outside Cambridge. Edwards wanted to make IVF acceptable but also, as the father of five daughters, to speak up for people who were infertile. Edwards was their champion in ethically charged battles with scientists, theologians, politicians and even Nobel laureates, whose pantheon he later joined. His hopes were vindicated, but success had come at the price of being accused of everything from killing embryonic ‘babies’ to courting the media.

Our beloved professor could be maddening when he rolled out ideas for experiments like a newspaper press. The late grande dame of embryology, Anne McLaren, a contemporary of Bob’s, once told me: “From scores of ideas, some gems he digs up sparkle so brilliantly they take your breath away.” Bob gave his students freedom to explore, and in an egalitarian environment we flourished.

Still full of energy after retiring in 1989, Bob became a founder–editor of several major journals and continued to oversee *Reproductive BioMedicine Online* until past the age of 80. He lived long enough to enjoy seeing his controversial programme enter mainstream medicine. IVF has led to the banking and donation of eggs and embryos, the ability to genetically diagnose embryos before they are implanted in the uterus, treatment for male infertility, and human embryonic stem-cell technology, which Bob had anticipated in the 1960s. Assisted reproductive technology has transformed the very definition of ‘family’.

Last year, Bob’s papers were on display next to the famous handbag of former British Conservative prime minister, Margaret Thatcher, at his college in Cambridge (Churchill). He and Thatcher were born and died within days of each other and, although political opposites, both stubbornly held visions of a different world, which they strove to make a reality. By 1990, Thatcher’s government had introduced legislation that made IVF widely available. It would be another 20 years and the Nobel Prize in Physiology or Medicine, which was awarded to Bob in 2010, before he was honoured with a knighthood. ■

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