CORRECTION: The conversation reported in the second paragraph of yesterday's obituary of **Peter Mitchell** took place in 1980, not 1950 as printed.

OBITUARIES

Peter Mitchell

PETER MITCHELL was one of the most brilliant and original of Britain's men of science, though he was little known outside his field until he received the Nobel Prize for Chemistry in 1978.

Mitchell was modest, perhaps excessively so, and reclusive. He told me in 1950: "I suppose that in a few years' time nobody will even remember me." And he believed that. He hated publicity of any kind and said: "I'm really worried by having attention drawn to me as a person." Two scientists who wrote the first popular article about him in 1975 in *New Scientist* remarked: "To say more about Mitchell the man would evoke a good natured retort on the telephone asking if we intended this article to be his obituary."

Mitchell had a magically warm and conspiratorial smile; indeed, he once signed a paper to me "To a co-conspirator". The conspiracy was simple: to try at all times to defeat humourlessness and intolerance, arrogance and closed thinking. And that was what his smile said to his co-conspirators; to others of whom he was not sure, his smile said: "Are you what I hope you are?" For he never believed himself superior to a single living person and he told me: "It worries me to think of people I don't know being unhappy. What I really care about is the people who are going to be alive after I'm dead." But he also had one of the most subtle and sophisticated senses of humour I have ever encountered and liked to laugh with, rather than at, the human condition, and at no individual but himself. He was the basis for the main character in Michael Mulkay's book *Pandora's Box* which dealt with the relationship of scientists' personalities to their work.

Mitchell entirely revolutionised the science of bioenergetics by effectively standing its theory on its head. For a time he worked at Cambridge and Edinburgh universities (where he was Reader), but most of his work was done in a private laboratory, the Glynn Research Institute, an eighteenth-century mansion in Cornwallwhich he restored with his own hands from a ruin. He pretended out of modesty that his institute was funded by foundation grants, but in fact he and his brother Christopher used the wealth they inherited from their family's construction firm, Wimpey, to fund the crucial work that led to the Nobel Prize.

If Peter Mitchell had had to be subject to peer review and to apply for grants he would have had little time left for his work and would not have received any grants anyway, thus getting nowhere. The sums of money he spent or research were vast, but he could not bear anybody to know about it. At all times he wished to be the Invisible Man. He could probably not have succeeded without the enduring love of his second wife, Helen ffrench, whose passionate devotion both to Peter the man and to his work gave him the emotional support he needed, providing the protection of his privacy and the spectacular hospitality to guests, as they were needed. Helen's French provincial cooking

and Peter's connoisseurship of fine wines meant that meals at Glynn were always of Michelin-star quality.

Also crucial to Mitchell's career was Dr Jennifer Moyle, his research associate from 1948 until her retirement a few years ago, who, in 35 years, "only really ever had one quarrel with Peter". For 20 years Mitchell was ridiculed, and Jennifer Moyle was his only professional supporter. So vicious was the scientific opposition to him that students were routinely lectured at some universities about how intellectually crazy he was. He was kept out of the Royal Society for many years by jealous scientific colleagues whose own theories were threatened by his work. But in 1981 the Royal Society awarded him their highest honour, the Copley Medal, by which time he had been a fellow for seven years.

Mitchell's work is hideously complex. But, simply, it used to be thought that cell walls were like partitions on a factory floor, and that the energy absorbed by animals and humans from food, and by plants from sunlight, was somehow turned into the energy necessary to run the body by purely chemical means – the so-called "bag of enzymes" theory, which postulated random and directionless processes. But Mitchell ignored mass ridicule to prove his hunch that in fact that "there was a direction to the flame of life", as one admirer later put it. He demonstrated that currents of protons passed through cell walls, which far from being idle partitions were actually riddled with directional pathways, and that this sensible and directed form of energy transport was at the basis of all life of bodily cells.

This discovery also showed for the first time a reverse form of electricity (which he named "proticity"), which he successfully demonstrated could run an engine and which may some day become a major factor in energy processes. The discoveries were a conceptual breakthrough as fundamental in cell biology as relativity theory was in physics. Scientists are still struggling to realise all the implications, and medical results will probably eventually follow.

The last 10 years of Mitchell's life were spent largely trying to raise funding for his institute after his own money dried up. His philosophical ideas, which he wanted to pursue and elaborate, were sacrificed to this desperate fundraising task. He had as much to offer in the areas of his other interests as he had in pure science, but one lifetime is too short for such a man, and his philosophical promise tended to be known only to a few friends such as Sir Karl Popper, whom he revered. Mitchell has been called "the Socrates of Glynn Valley"; the historical Socrates restored old buildings and worked in stone as Mitchell did, and they both devoted themselves to philosophical questioning at a deeply profound level of conversation.

Peter rose far above the level of "the great man" (which, hating all pomposity he could never have been) to be in the quiet of his Cornwall retreat what I can only call a great and old soul. His nature was so kind, so gentle, so tolerant and sympathetic; he survived so cheerfully the decades of abuse from jealous and petty colleagues without rancour in his heart or blame towards anyone. However outstanding his achievements in science, his human qualities were of a higher order still.

Robert Temple

Peter Dennis Mitchell, biochemist, born Mitcham Surrey 29 September 1920, Founder and Director of Research Glynn Research Laboratories 1964-86, FRS 1974, Nobel Prize for Chemistry 1978, Chairman and Honorary Director Glynn Research Institute 1987-92, Visiting Professor King's College London 1987-89, married Eileen Rollo (one son, one daughter; marriage dissolved), 1958 Helen ffrench (two sons), died Glynn Cornwall 10 April 1992.