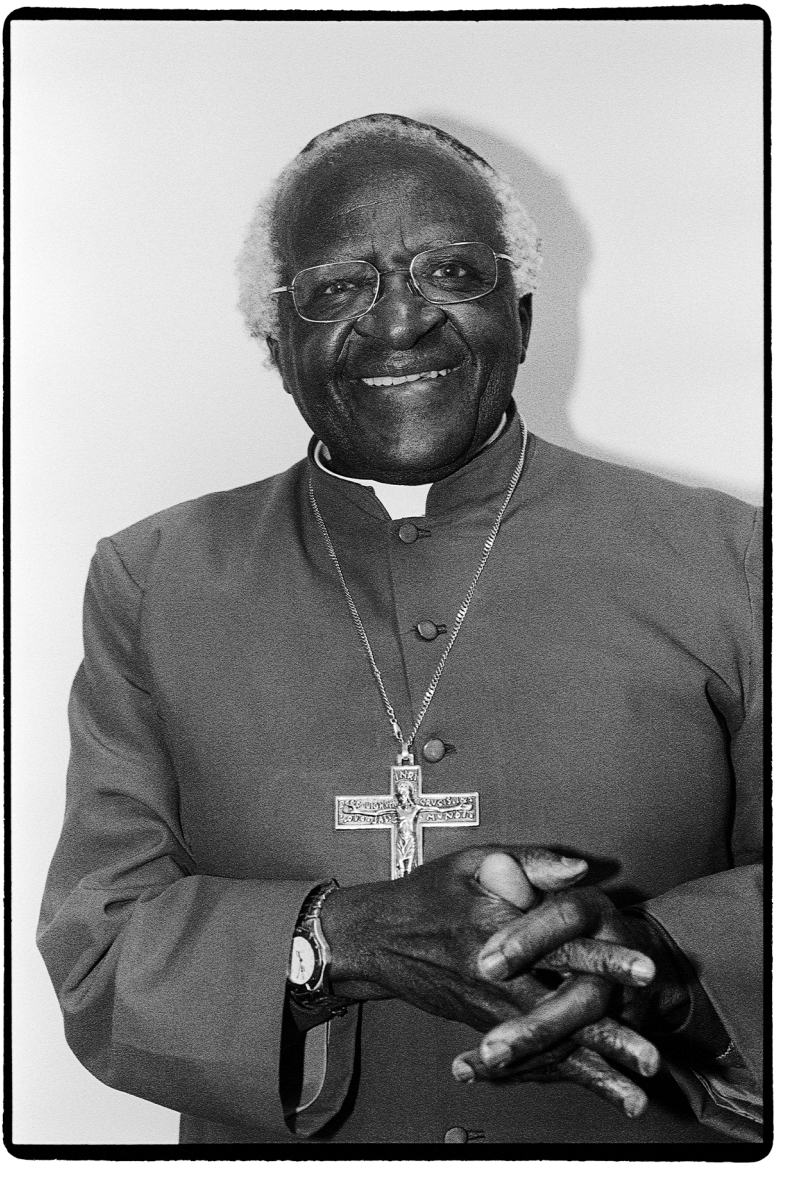
Possibly unique among Nobel laureates, not to mention the clergy, Bishop Desmond Tutu has been immortalised as a nightclub (Desmond's, at King's College, London, UK) and as a British slang term (a 'Desmond' is a lower university pass grade – a '2:2'). But, like many other laureates, he seems to have entered his vocation by accident. He was born in 1931 in Klerksdorp, Transvaal, and hoped to be a doctor, but his family couldn't afford the training so he followed his father into teaching. In 1957 he resigned in protest at the Apartheid Bantu Education Act, which he decried as 'gutter education' for black students. He turned to theology, and in 1960 was ordained as an Anglican priest. He became chaplain at the University of Fort Hare, a rare quality university for black South Africans and a hotbed of political dissent, before heading to Britain in 1962, to study theology at Kings College, London. After graduating, he returned to South Africa to teach theology and used his lectures to highlight the circumstances of the black population. He was appointed vice-director of the Theological Education Fund of the World Council of Churches and in 1975 became the first black Anglican Dean of St. Mary's Cathedral in Johannesburg.

In 1976 student protests led to a mass uprising against apartheid. Tutu, now Bishop of Lesotho, supported an economic boycott of his country. In 1978 he became the first black General Secretary of the South African Council of Churches. He was also the first black Archbishop of Cape Town, and primate of the Church of the Province of Southern Africa. After the fall of apartheid, he headed the Truth and Reconciliation Commission, for which he was awarded the Sydney Peace Prize in 1999. The Nobel Committee cited his "role as a unifying leader figure in the campaign to resolve the problem of apartheid in South Africa."

Tutu has often spoken against injustice and 'apartheid' in other nations, criticising Israel's policy in Palestine, the Indonesian takeover of West Papua, and the US's treatment of inmates at Guantanamo Bay, Cuba. He has denounced Zimbabwean president Robert Mugabe as a "caricature of an African dictator", and criticised South Africa's policy towards Zimbabwe. He has also spoken in favour of gay rights, womens rights, and called for the Catholic Church to allow contraception to fight Aids in Africa, but he has praised the efforts of Christian churches to work together. His speeches have been collated into several books.

He was awarded the Light of Truth award by the Dalai Lama for publicising the plight of Tibet, and is an honorary doctor of a number of leading universities. He has been married to Leah Nomalizo Tutu since 1955. They have four children.

Peace, 1984



Robert Laughlin, with Horst Störmer, (Germany/USA) and Daniel Tsui (China/USA) received the 1998 Nobel Prize in Physics for the discovery and explanation of the fractional quantum Hall effect. In 1879 Edwin Hall found that the electric current in a thin plate in a magnetic field is deflected, leading to a potential drop over the plate. In 1980 Klaus von Klitzing (Nobel prize 1985) found that, while varying the strength of the magnetic field smoothly, the change in the potential drop occurred in jumps, thus exhibiting quantum properties.

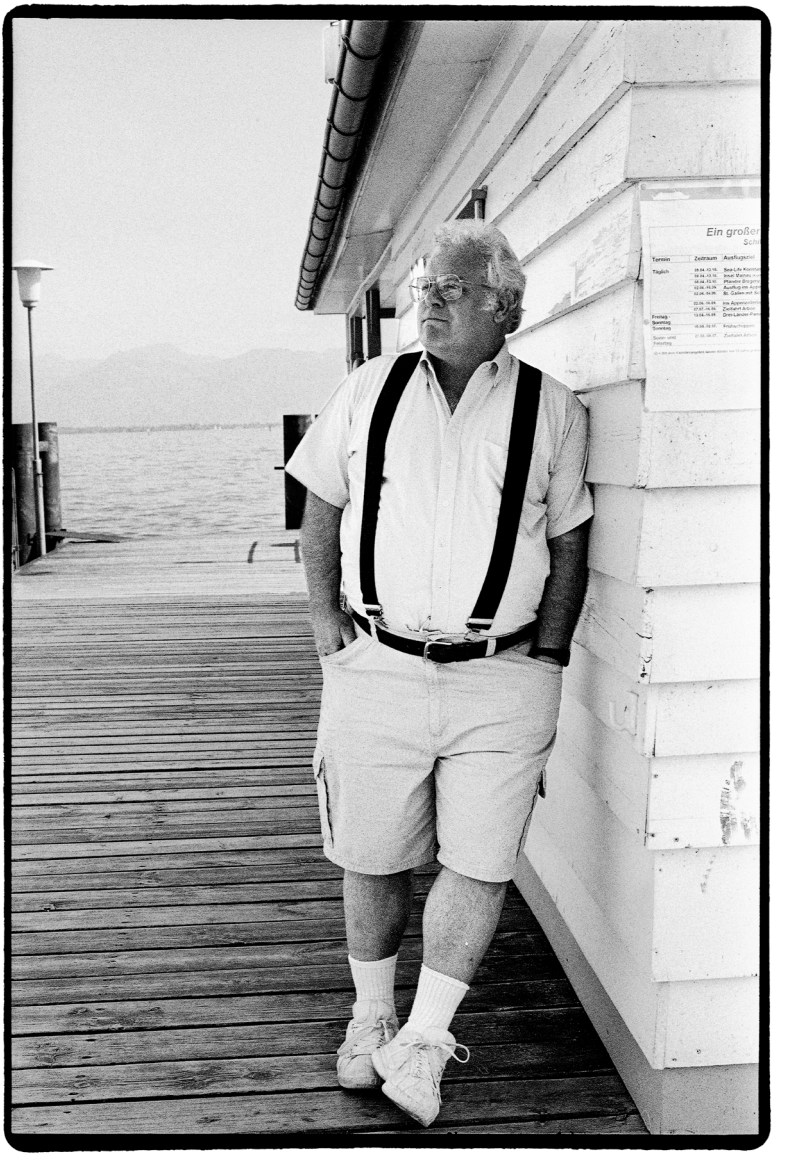
Tsui and Störmer then found that the quantum changes occurred in fractional increments of the steps observed by Klitzing. It was now the 'fractional quantum Hall effect'. In 1983 Laughlin offered an explanation of the phenomenon, that in a powerful magnetic field at low temperatures, electrons combine with the magnetic field quanta and condense into a new kind of quantum fluid. Adding just one electron will affect (excite) the fluid, creating a number of fractionally charged 'quasiparticles'. These explained Störmer's and Tsui's results and all subsequent refinements.

Robert Betts Laughlin was born in Visalia, California, in 1950. Introverted, but interested in technology, Robert made a working colour TV from a kit, taught himself how to blow glass to make chemistry plumbing and tried to make sodium metal but accidentally poured it over his right hand. Miraculously, his hand recovered fully. In 1968 he entered UC Berkely to study electrical engineering, but took quantum mechanics under Owen Chamberlain. His studies were disrupted by the Vietnam war. Anxiety at receiving his draft papers caused Laughlin to fail physics, but his degree in mathematics meant that he was assigned to a Pershing nuclear missile battery and sent not to Vietnam but to southern Germany.

In 1974 Laughlin entered MIT, where he concentrated on solid state physics, gaining a PhD in 1979 and joining the Theory Group at Bell Labs. There he worked with both Tsui and Störmer. Unfortunately, just as they began their studies of the quantum Hall effect in 1981, Laughlin's contract expired. He moved to California, and joined Lawrence Livermore National Laboratory, a firm specialising in nuclear defence contracts. Within months he received news of Tsui and Störmer's discovery of the fractional quantum Hall effect.

He was inspired to write an explanation of the effect. After a flawed first draft ("It was rejected [by the Physical Review Letters], thank God.") he computed the properties again from scratch. This time his letter was published. The success of his theory brought several academic offers, and in 1985 he joined Stanford University, where he rose to professor in 1989. From 2004-06 he served as the president of Korea Advanced Institute of Science and Technology (KAIST) in Daejeon, South Korea. Laughlin met his wife Anita at MIT. They have two sons.

Physics, 1998



Paul Berg is an American biochemist and professor emeritus at Stanford University. He received one of the two 1980 chemistry prizes "for his fundamental studies of the biochemistry of nucleic acids, with particular regard to recombinant-DNA". His studies showed how to introduce genes from one DNA molecule into another and thus laid the foundation for genetic engineering.

Berg was born in 1926 in Brooklyn, New York. As a boy he wanted to emulate medical scientists and joined an after-school science club. He graduated from Abraham Lincoln High School in 1943 and enrolled at New York's City College to study chemical engineering. He also enlisted in the Navy and flew anti-submarine aircraft during the war, returning to his studies in 1946 at Pennsylvania State College and earning his biochemistry degree two years later. As a project during his senior year, Berg studied radioisotopes as tracers, tracking the conversion of foodstuffs to cellular materials. Much of his research material came from Western Reserve University in Cleveland, Ohio, which he made his next destination. This, he says, was a good choice, as WRU's pioneering work in this field had made it a leading biochemistry centre in the US.

Berg gained his PhD in 1952 by exploring the conversion of formic acid, formaldehyde and methanol to their fully reduced state, and was among the first to demonstrate the role of folic acid and vitamin B12 in these processes. He also studied in Copenhagen at the Institute of Cytophysiology, where he and a colleague discovered a new enzyme, and at Washington University in St Louis, where he discovered a previously unknown class of biological compounds - acyl adenylates – used in the linking of amino acids to tRNAs. He remained in St Louis as assistant professor for six years, moving to Stanford in 1959 to help set up the new department of biochemistry. There he developed an interest in mammalian cells and experimented with Polyoma and SV40 tumor viruses. He used SV40 to introduce new genes into mammalian cells, and developed a way to join two DNAs together. This was the start of recombinant DNA technology, and one of the earliest practical results was the development of a strain of bacteria for producing insulin. However, it also opened the floodgates for gene-splicing or Genetic Modification technology, which is still treated with suspicion by many.

More recently, his team's research involved genome projects and study of the HIV-1 virus.

Berg remained at Stanford until he retired in 2000. Since then he has written a biography of the genetics pioneer George Beadle, published in 2003, and campaigns in favour of stem cell research. He was awarded the National Medal of Science in 1983.

Chemistry, 1980

An adult human comprises roughly 100 000 billion cells all originating through division from a single fertilised egg cell. To do this the cell swells, duplicating its chromosomes to split into two equal cells. The 2001 award in physiology or medicine was divided evenly between Tim Hunt and Paul Nurse, both of the Imperial Cancer Research Fund (ICRF), UK, for their individual discoveries concerning molecules that regulate the cell cycle, and American Leland Hartwell for his discoveries of a specific class of genes that control the cell cycle. This may open new possibilities for cancer treatment, as defects in cell cycle control may lead to the type of chromosome alterations seen in cancer cells. In the early 1980s Hunt discoved the first cyclin molecules, so named because the levels of these proteins vary during the cell cycle. The cyclins bind to the CDK (cyclin dependent kinase) molecules, regulating the CDK activity and selecting the proteins to be phosphorylated. He showed that cyclins are degraded at each cell division, an important mechanism for cell cycle control.

Tim Hunt was born in 1943 at Neston in the Wirral, near Liverpool, but grew up in Oxford, where his father worked at the Bodleian Library. His education began oddly with latin lessons from a governess, and the infants department of the Oxford High School for Girls before moving to the Dragon School, where he first became fascinated by biology. At 14, he entered Magdalen College School, where his interest in science grew – he even dissected his brother's pet rabbit when it died – and attended regular lectures in the city. In 1961 Hunt entered Clare College, Cambridge, to read natural sciences. He joined the department of biochemistry in 1964, working on the control of translation of mRNA. In 1966, he visited Irving London at the Albert Einstein College of Medicine in New York for further studies, and joined him full time after gaining his PhD in 1968.

Hunt returned to Cambridge and continued to work on RNA throughout the 1970s, and began teaching summer courses at the Marine Biological Laboratory, Woods Hole, Massachusetts, to look at changes in protein synthesis in sea urchin and clam eggs after fertilisation. In 1979, he helped Joan Ruderman and Eric Rosenthal with experiments on the translational control of maternal mRNA; the major mRNAs concerned later turned out to be the A and B-type cyclins. By 1982, Hunt felt he had exhausted the potential of sea urchin eggs, but it was then that he performed a simple protein experiment that led to the discovery of cyclins and their degradation. In 1990, Hunt joined ICRF, (now Cancer Research UK) in London. He became a fellow of the Royal Society in 1991 and a foreign associate of the US National Academy of Sciences in 1999. He was knighted in 2006.