

## Women in science: Pioneers blaze path for ot

The Royal Society has named its top 10 female scientists, yet many still feel marginalised

By Rachel Shields

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They have mapped the infinity of space, developed spray-on skin for burns victims, pioneered cancer-beating therapies, created cutting-edge computer chips, discovered the first radio pulsars, and won Nobel prizes. But female science professors are still being asked to make the tea and take notes at meetings by their – often junior – male colleagues.

Sexism remains all too prevalent in Britain's scientific community, according to some of its leading figures, even as The Royal Society unveils a list of the 10 greatest women scientists in British history.

Women scientists this weekend called for government funding to be ring-fenced for projects headed by women, and men who are principal child carers, to help them get ahead in what remains a male-dominated profession.

"If you are on high-level committees, you'll be asked to make the tea," said Professor Athene Donald, the deputy head of physics at Cambridge University. "Recently, on a committee, the chairman thought I was the secretary. And I've been in committees where we've been addressed as "gentlemen", despite the fact that there are women there. It is very off-putting."

Baroness Greenfield, who is suing the Royal Institution after it ousted her as its director in January, has criticised the Government for failing to provide enough financial support for women trying to make a career in the sector.

"However much people support and encourage women, it has got to be backed by resources. The Government has never really delivered that," said Lady Greenfield.

"I hope that the election campaign addresses this. What is needed is about £50,000 a year per woman, and then add the cost of equipment, and you are looking at £200,000 for one person. Science research is expensive."

Lady Greenfield also argues that the insecure nature of science research puts women at a disadvantage: most research contracts until they secure a fixed position in their thirties and forties; maternity leave provision is career break at that stage can leave them way behind their male peers.

"Many people won't have security of tenure until they are in their thirties. It is one of the few employment c

It is thought that the subject's "nerdy" image puts girls off studying science beyond GCSE, and the sector at least 70 per cent of women science graduates deciding on non-science related careers.

One of the aims of the Government's 10-year strategy on science and technology, launched in 2004, was to

"The science and technology professions have been built by men, for men," said Annette Williams, the director of the Centre for Women in Engineering and Technology. The centre was established in 2004 to address the gender imbalance by using

"Often, women can find the climate quite hostile. And science and technology are so male-dominated that tl

flexible working," said Ms Williams.

The Royal Society, which did not allow female fellows to join until 1945, is using its 350th anniversary year to honour Rosalind Franklin, whose work on DNA led directly to the discovery of the structure of the DNA molecule, an achievement in chemistry.

Despite the negative experiences of many female scientists, some believe that the situation is improving. "Twenty per cent of the total in 2004 to 11 per cent now. I think we had something to do with that," said Ms Williams.

While women may be under-represented in science, few are in favour of "quotas" of jobs being reserved for women.

"Affirmative action can be very damaging. Women don't want to be appointed because they are women, the Professor Donald. "But if you advertise a job, you should have a proper search, and encourage women to compete."

## **The Royal Society Top 10**

### **1. Caroline Herschel (1750-1848)**

As an assistant to her brother, a royal astronomer, Herschel discovered eight comets and catalogued stars. She received a salary and was awarded many honours.

### **2. Mary Somerville (1780-1872)**

The Scottish scientist was only the second woman to receive recognition in the UK for her scientific experiments. Her renditions of the French astronomer Laplace's book *Traité de Mécanique Céleste* made her famous.

### **3. Mary Anning (1799-1847)**

The daughter of poor fishermen, the palaeontologist made a number of important finds in Lyme Regis, including the first skeleton and the first two plesiosaur skeletons ever found. She also discovered important fish fossils.

### **4. Elizabeth Garrett Anderson (1836-1917)**

Denied entry to medical school, Garrett Anderson instead passed the Society of Apothecaries examination to establish the New Hospital for Women in London and was influential in the passing of an Act permitting women to enter the profession.

### **5. Hertha Ayrton (1854-1923)**

Working with her husband, Professor William Ayrton, Ayrton published several papers on the electric arc. In 1900 she became a fellow of the Royal Society, although as a married woman she could not accept.

### **6. Kathleen Lonsdale (1903-1971)**

A pioneer of X-ray crystallography – the study of molecule shapes – in 1945 she and Marjory Stephenson were elected to the Royal Society. She was the first female professor at University College London, and the first woman to be president of the Royal Society for the Advancement of Science.

### **7. Elsie Widdowson (1908-2000)**

Her work with Professor R A McCance revolutionised the way the world assessed nutritional values and how to deal with nutritional problems during the Second World War, and on treating the effects of starvation suffered by prisoners of war.

### **8. Dorothy Hodgkin (1910-1994)**

Hodgkin discovered the structure of penicillin and of vitamin B12. She was awarded the Nobel prize for her work in 1962. She devoted much of her later life to championing scientists in developing countries.

### **9. Rosalind Franklin (1920-1958)**

Her work on the X-ray diffraction images of DNA was used to formulate Crick and Watson's 1953 hypothesis on the tobacco mosaic and polio viruses.

#### **10. Anne McLaren** (1927-2007)

McLaren produced the first litter of mice grown from eggs that had been developed in tissue culture and transferred to a human in vitro fertilisation.

### **Today's Trail Blazers**

#### **1. Susan Greenfield** Professor of pharmacology, University of Oxford

"People don't sell science to young people, and especially to girls, as well as they might. It takes time and a lot of things are regarded very badly in the scientific community, it is seen as 'dumbing down'."

#### **2. Patricia Fara** Director of studies, history and philosophy of science, Cambridge University

"Younger women believe there is no discrimination against women in science, but I think that is optimistic. I have projects. It certainly isn't a level playing field, you just have to look at the statistics. It is tough for women."

#### **3. Julia Higgins** Professor of polymer science, Imperial College London

"Even now women in science are rather invisible. It is a cultural thing. When people talk about Newton and did amazing things, too."

#### **4. Uta Frith** Emeritus professor of cognitive development, University of London

"We still have a long way to go. Women had a late start in the profession. I'm privileged to be one of the few many talented women who will do great things."

#### **5. Sunetra Gupta** Professor of theoretical epidemiology, Oxford University

"It is only since I undertook to write a children's book on women scientists that I have come to know their lives makes me realise how much of a need there is for the book."

#### **6. Maggie Aderin-Pocock** Royal Society university research fellow and a space scientist for Astrium Ltd

"My career has been great up until now, but I'm due to give birth to my first child in three weeks time, so that's a problem in science, as you aren't keeping up with the cutting-edge research."

#### **7. Athene Donald** Deputy head, department of physics, Cambridge University

"There is an unconscious bias. The number of women science professors is only about 11 per cent. It is important we are working really hard over the gender issue. That they put their hands up and say 'mea culpa' is a positive step."

#### **8. Helen Mason** Solar physicist, Cambridge University

"Research grants have been cut and universities are suffering financially; people are being made redundant and hit hardest by this. Indeed, I know that this is happening, and I feel powerless to stop it."

#### **9. Ottoline Leyser** Professor of biology, University of York

"The list highlights how tremendously recent it has been that we've had the equality we are now enjoying, and it's coming faster."

#### **10. Nancy Rothwell** MRC research professor, University of Manchester

"I'm often asked how I manage in a male dominated profession. I just don't recognise this description. I have a lot of support."

colleagues."

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