Shining example

It is rare for a scientist to achieve prominence both in a technical environment and in the world of social and individual morality and ethics. In *Chemistry in Britain* for January, Peter Childs, a lecturer in chemistry in the University of Limerick, has assessed the character and scientific achievements of a woman who presented a broad genius, and who was born one century ago, on 28 January1903, in Newbridge, County Kildare. She was Dame Kathleen Lonsdale who "played a fundamental role in establishing the science of crystallography and in her scientific career scored several important firsts".

Kathleen Lonsdale studied chemistry, physics and mathematics and earned distinctions in them. On entering Bedford College, University of London, she studied mathematics but soon switched to physics.

One of her examiners was the pioneer of x-ray diffraction, W. H. Bragg, who persuaded her to join his research school at University College, and her subsequent work was with crystal structures. Her investigation of hexamethylbenzene crystals demonstrated that the benzene ring was flat, a previously disputed assertion. In 1945 Kathleen was one of the first two women to be admitted to fellowship of the Royal Society, and in 1949 she became professor of chemistry at University College London.

Yet perhaps the most notable feature of Kathleen's life was her untiring work for peace and social justice. From a strict Baptist upbringing she, with her husband, turned to the Quakers, and she was imprisoned for one month during the 1939–45 war for refusing to pay a fine imposed for a registration offence. This experience gave her an interest in prison reform. She was involved in movements to promote peace, and visited many countries lecturing on science and religion and the restricted role of women in science, particularly if they were married and had family responsibilities.

She placed high value on lecturing in schools, and I once had the privilege about 40 years ago of hearing her address at a school prize-giving ceremony, in which she offered sound and logical advice to the students on the moral and religious aspects of a career. We could benefit from more scientists like Kathleen Lonsdale.

Ancestral habits

In *Antiquity* for December 2002, two archaeologists, from Belfast and Bradford, throw an interesting sidelight upon the changing habits of our distant ancestors who occupied coastal habitats at a time when coastlines were on the change. This has some relevance for us today since we live in an era when global warming, which a few decades ago was widely dismissed as a fiction, has come to be accepted by all but the most bone-headed politicians and planners, and when sea levels are rising to the extent that dwellers on the shoreline are perturbed over their future survival.

Isotopic analyses, which are capable of distinguishing between marine and terrestrial diets of our fossilised ancestors, were used to determine human development between the Mesolithic and Neolithic periods at the start of the sixth millennium before present. Although human remains among Mesolithic populations are classed as "notoriously rare" in Britain, they have been found at Mendip sites that were tens of kilometres from the coast at the time, and at sites in southern Wales where the coast was immediately adjacent, as at Caldey Island off Pembrokeshire. Bones from Caldey have yielded information that indicates shifts of population of the coastal area at the time of change from Mesolithic to Neolithic culture.

Bone samples from five sites in Caldey showed that individuals adopted significantly different diets during the three millennia representing the cultural change. Changes from marine to terrestrial foods may be the result of seasonal movements of the population between the sea coast and the interior as minor climate changes occurred, but they also raise the interesting question of the relationships that may have existed between the coastal and terra-firma tribes at the time. Apparently a major shift in subsistence economy arose at the start of the Neolithic, when the consumption of marine foodstuffs, mainly shellfish, seems to have declined markedly. This would be reflected in changing settlement patterns, community structures and social organisation.

Vital spark

Anna Williams, born near Haverfordwest in 1706, was a remarkable woman by all accounts. She was a friend of Samuel Johnson, well educated, and a poet in her own write. When she accompanied her father to London in 1727 she began to assist Stephen Gray, an enthusiast for things electrical, in his experiments with static electricity produced by friction. She claimed to have been the first person to notice and describe the emission of sparks from an electrically charged human body. In 1740 Anna lost her sight and, being left alone after her father was admitted to an institution, was accommodated by Johnson at his various residences from 1752.

In *Science* for 20 December 2002 two scientists from Graz and Chicago have described the development of experiments in static electricity by Gray, Williams and others during the 18th century. The authors state that Gray was the first to demonstrate human electrification by showing that a child suspended on silk lines from the ceiling and charged from a rubbed glass tube would attract fragments of gold-leaf. This was in 1732. Then, in 1734, Charles Dufay described his experiment on the same lines and confirmed Gray's findings.

But Dufay also noted that if he electrified his own body other phenomena occurred. If another person brought his hand within an inch of Dufay's body, ". . . there immediately issues from my Body one or more pricking Shoots, with a crackling Noise that causes to that Person as well as to myself a little Pain resembling the burning from a Spark of Fire." Gray gave Dufay full credit for this discovery.

Recognition of the work of Anna Williams was not as forthcoming. In a book called 'Miscellanies in prose and verse' (1766), Anna claimed: "The Publisher of this Miscellany, as she was assisting Mr Grey [sic] in his experiments, was the first that observed and notified the emission of the electrical spark from a human body." It is strange that Gray failed to acknowledge this. He is reputed to have had a difficult personality, and was unwilling to accept any opposition from others. On the other hand, Anna herself tended to overestimate her own achievements, on the evidence of an argument she had over whether some of her verse was original or had been modified by Johnson.

Whatever the truth about the sparking controversy, the technique of charging a body and drawing sparks and shocks from it became a popular amusement at fairs and public demonstrations in the 18th century, and static electricity generators were devised to support the craze, which continued into our own times.

We ought to remember the contribution made by Anna Williams to the whole affair.