AIMS For a better birth...

In memory of Alice Stewart

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Caroline Richmond remembers the epidemiologist who showed that X-rays in pregnancy caused childhood leukaemia

Alice Stewart, who died aged 95, was one of Britain's foremost epidemiologists for 50 years. Early in her career, she showed that X-raying fetuses, a common way of monitoring pregnancy in the 1950s, was the cause of childhood leukaemia. Later, she revealed the harmful effects of low-level radiation and championed the cause of nuclear industry workers.

Alice's mother must have been one of the first entrants to the New Medical School for Women (later, the Royal Free's medical school). Her parents, Lucy and Albert Naish, planned to practice medicine together in Harrogate, but a senior partner refused to allow the nameplate of a woman on the surgery door. So they moved to Sheffield and became paediatricians working in the slums (with eight children of their own, four of whom became doctors) and local heroes for their dedication to children's welfare.

Alice inherited her mother's intuition and gift for problemsolving, and her father's analytic intelligence and talent for diagnosis. Dashing and beautiful, she also inherited their commitment to the betterment of society and willingness to sacrifice financial gain for the prevention of disease.

She entered Cambridge Medical School as one of four women among 300 men, who stamped their feet when the women entered the lecture theatre and slammed their desk lids when they sat down. She qualified in 1932.

Barred from hospital work because she was a woman, Alice did her clinical training at the Royal Free and, during the war, worked in the Emergency Medical Services and then in the Nuffield Department of Clinical Medicine at Oxford. There she investigated the effects of TNT on munitions workers, carbon tetrachloride, pneumoconiosis (a lung disease caused by inhalation of particles) in Welsh miners and the curious prevalence of tuberculosis among workers in the footwear industry. Her TNT report, kept secret,was important enough to lead to her becoming a Fellow of the Royal College of Physicians - the first woman under 40 to do so, and only the ninth woman ever.

Having proved her worth, she was brought into the Oxford child health surveys. Childhood leukaemia was increasing and no one knew why. After interviewing mothers, she soon saw the correlation with X-rays, which she demonstrated statistically. X-rays were medicine's new toy and were being used for everything from examining the position of the fetus to treating acne.

Her leukaemia-pregnancy link - made in 1956 - was resisted by obstetricians and radiologists, who closed ranks in outrage at her 'heresy'. But her revelations soon led to a ban on X-rays in pregnant women. Her work was also opposed by physicists and radiobiologists, the UK National Radiation Protection Board, International Commission for Radiation Protection, and the powerful nuclear lobbies that the ICRP seemed to serve. As this was at the height of the arms race, both the British and US governments wanted to build public trust in the 'friendly atom', not spread the idea that low-dose radiation could kill their children.

Stewart survived opposition to become director of Nuffield Institute of Social Medicine at a time when it was highly unusual for women to be in senior positions at Oxford. In 1974, aged 68 and obliged to retire at Oxford, she moved herself, her research grants and team to Birmingham University, where she and her statistician colleague George Kneale were contacted by Dr Thomas Mancuso, on behalf of the US Atomic Energy Commission, to study the health of nuclear workers at a plutonium-manufacturing complex in Hanford, Washington. As the industry was required by law to work within exposure levels laid down by the ICRP, the study was also a test of those standards. The Stewart-Kneale-Mancuso analysis revealed over 10 times the incidence of cancer predicted from atomic bomb-survivor studies.

An immediate and damning official outcry ensued. Stewart was to further infuriate the establishment by pointing out that until the nature of radiation damage to genes was understood at the molecular level, predictions of second-generation and long-term genetic effects could not be properly made.

She spent the next 20 years as a professor and senior research fellow at Birmingham, working from a caravan, professionally isolated and attacked, paid a pittance and starved of research funding.

In the mid-80s - at age 80 - she was awarded a $2 million grant from the Three Mile Island Public Health Fund. She was in demand at conferences, hearings and inquiries in England, Europe and the US. She testified for nuclear workers seeking compensation, for British and American veterans of atomic testing and for the women arrested for protesting the siting of cruise missiles at Greenham Common.

In the 1990s, Sir Nicolas Kurti put her forward for a Fellowship of the Royal Society, but was unable to overcome the opposition. In 1997, she was awarded an honorary DSc at Bristol University.

Alice Stewart also loved her home, family, garden and countryside, and always had time for her two children and four grandchildren. She is the subject of a biography - The Woman Who Knew Too Much: Alice Stewart and the Secrets of Radiation by Gayle Greene (University of Michigan Press, 2001).

Alice Mary Naish
Epidemiologist and expert on radiation and health
Born Sheffield, 4 October 1906
Married Ludovick Stewart 1933
(one son deceased and one daughter)
FRCP 1946
Died Oxford, 23 June 2002