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Lotte Auerbach, who died on 17 March 1994, was born in Krefeld in 1899, the only daughter of Jewish parents. Her father was a physical chemist and her grandfather the discoverer of *Auerbach's plexus* in the human intestine. From her early introduction to biology at school, her interest was fostered by her father for whom the natural sciences became a passion. Her interest in the then still infant science of Genetics was kindled by a school lecture on the behaviour of the chromosomes at cell division which she later described as one of the truly spiritual experiences of her life. Her grandfather was similarly absorbed by the study of chromosomes to the extent that, as Lotte loved to relate, when on his honeymoon he left his young wife at their hotel while he visited the nearby university to discuss new developments. The discussion was so interesting that he forgot her entirely and accepted an invitation to dinner to continue talking. Fortunately forgiveness was granted and the marriage was a happy one or perhaps this account would not have been needed!

Lotte's university career took her to Wurzburg, Freiburg and Berlin and she obtained her Staatsexamen in 1924. A small legacy enabled her to embark on a PhD degree course at Berlin-Dahlem but things did not go well. She had misgivings about her project and raised them with her supervisor only to be told that what she thought was of little importance; she was expected to do as she was told! She was not one to compromise on such an important matter and, judging her future in the university system as a single woman without financial security as unpromising, she decided to leave the university and to take up secondary school teaching in Berlin. Although she loved children and later was to fascinate generations of Genetics students with her lectures, her teaching days in Berlin were not a great success and she found keeping order in class exhausting. So perhaps it was a blessing in disguise when on 1 April 1933 she, like other Jewish teachers, was forced to resign her post. Taking her mother's advice she came to Edinburgh where she resumed her PhD studies at the Institute of Animal Genetics and was awarded the degree in 1935.

Undoubtedly the pivotal point in her life was her encounter with H J Müller when he visited the Institute in 1938. Müller had discovered the mutagenic action of X-rays some years earlier and it was he who persuaded Lotte to investigate the mutagenic action of selected chemicals as a way of probing the nature and properties of the gene. In 1941, in collaboration with the pharmacologist J M Robson, she demonstrated the mutagenic action of mustard gas. The unequivocal nature of these results was, as she frequently pointed out, attributable to the elegant genetic tests originally developed by Müller but the sophisticated analysis which followed was hers alone. Müller remained her friend and mentor for many years.

By the time these initial experiments were finished the war had started and the results could not be published because of their sensitive nature. Furthermore Lotte's life was somewhat complicated by an ill-defined position at the Institute which paid very little and the fact that she had also been joined by her mother whom she had to support. She was, however, spared the problems of some other foreign scientists in Britain at the time. In 1939 she had become a British citizen and although her strong German accent sometimes attracted unwelcome attention from the authorities, she was largely left alone to continue her work and to make a careful comparison of the mutagenic action of alkylating agents and ionising radiation. When these studies were made public in 1946 their impact on the scientific community was considerable and almost overnight she became a well known and respected scientific figure and was appointed a lecturer by the University. The RSE awarded her its Keith Prize in 1947 (the same year as she received the degree of DSc from Edinburgh) and she was elected to Fellowship in 1949.

This work formed the basis of much of her later studies. She had noticed that the mutagenic effects of X-rays differed drastically from those of alkylating agents. Whereas X-rays produced whole-body mutations in *Drosophila*, the alkylating agents she was studying produced predominantly fractional changes. This was particularly clear in the case of lesions which went on to produce chromosome structural changes. She also noted that X-rays produced a far greater ratio of chromosomal to gene mutations than did chemical agents. She was able to account for both these observations by proposing that while X-ray-induced mutations are immediate, chemically induced mutations are delayed because the lesions which produce them take time to be realised. So, whereas the genetic damage from X-rays is realised before the fertilised egg divides and passes to all the tissues of the embryo, the effects of chemicals are sometimes delayed for several cell divisions and then may only affect some of the cells of the developing fly. This idea later received support from meticulous cytological studies by Helena Slyzinska with whom Lotte collaborated and who was, herself, a refugee from Poland. Examining the implications of the hypothesis provided PhD projects for a number of students.

In 1957 Lotte was elected to fellowship of the Royal Society of London and in 1959 she was invited to direct the MRC Mutagenesis Research Unit in Edinburgh. By this time her interests had extended to include microorganisms and for the next ten years she pursued her goal of demonstrating that mutagen specificity is not simply determined by the reaction between the mutagen and DNA. She saw that as only the start of a multi-step process which ends in the fully expressed and observable mutant clone. Some of these steps, she maintained, were also susceptible to attack by the sometimes highly reactive chemical agents which cause DNA changes and she expended considerable effort in demonstrating the point in a variety of different ways. She was finally to retire in 1969 but not before she was appointed to a personal chair. After her retirement she maintained an active interest in mutation research as Professor Emeritus. She was, in fact, a recipient of an MRC project grant at the age of 84. However, she was eventually forced to relinquish her involvement because of failing eyesight.

She had a passion for communicating science. Her lectures were models of clarity, usually delivered without notes. The difficulties she had experienced with school teaching no longer plagued her. Things were known to go wrong, however, and she sometimes recalled with some mirth the occasion when the mice she was using to demonstrate the genetics of coat colours escaped and caused chaos in the lecture room. The importance she attached to understanding Genetics is reflected in a stream of Genetics texts she wrote for students. The more popular of these were translated into many languages some of which she could not read herself, and it sometimes worried her that she could not check the translations for accuracy. She also travelled extensively, giving lectures and participating in scientific meetings. On occasions she felt the need to speak out unequivocally on genetically related political issues which she felt were either misunderstood or being misrepresented. In South Africa, for example, she spoke out against Apartheid with unquestionable authority as she did on certain theories of the genetic determination of intelligence and she was a constant and outspoken critic of the continued testing of nuclear weapons.

Although Lotte could find friends and colleagues in virtually every country in the world, and continued to enjoy visiting them and discussing science well into her 80s, she always regarded Scotland as 'home'. Through her unstinting generosity to Scottish causes she never forgot her debt to the country that gave her a home in the dark days of the late 1930s. Her career advancement was slow by

today's standards and she must sometimes have been tempted by the foreign offers she received. One of these certainly came from West Germany but she politely declined it saying to her friends that she would rather be a lab girl in Scotland than a professor in Germany. It is interesting that she, herself, did not regard her experimental findings as particularly out of the ordinary and was extremely modest about them. She felt her main contribution to science was in the exercise of her critical faculties and, as many a student and fellow scientist learned, she was a thorough but fair critic who always seemed to have time to discuss a problem and who displayed immense patience and persistence in drawing out the correct interpretation from the data (or at least eliminating the wrong ones) whether they were her own or those of others.

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