OBITUARY

Barbara McClintock (1902–1992)

BARBARA MCCLINTOCK, pioneering geneticist and Nobel laureate, died on 2 September in Huntington, New York, after a brief illness. McClintock recently had been fêted on her ninetieth birthday by a gathering of friends at Cold Spring Harbor and the preparation of a unique volume in her honour, *The Dynamic Genome: Barbara McClintock's Ideas in the Century of Genetics* (reviewed in *Nature* of 20 August).

McClintock was born in Hartford, Connecticut, and raised in Brooklyn, New York. She received her BS (1923) and PhD (1927) degrees from Cornell University, where she continued to work as a research associate in R. A. Emerson's laboratory together with George Beadle, Marcus Rhoades and Charles Burnham — the Cornell corn group. Following a brief stint as an assistant professor at the University of Missouri, she moved to Cold Spring Harbor in December 1941. For more than 50 years, she lived and worked at the Cold Spring Harbor Laboratory under the auspices of the Department of Genetics of the Carnegie Institution of Washington.

Marcus Rhoades

Barbara McClintock in 1929, when she was a member of R. A. Emerson's maize genetics group at Cornell. The others (standing, right to left) are Charles Burnham, Marcus Rhoades and Emerson, with George Beadle squatting.

McClintock rose quickly to prominence through a series of remarkable experiments on her favourite organism, corn (otherwise maize). In her thesis work she assigned linkage groups established by genetic analysis to cytologically identifiable chromosomes using an ingenious analysis of triploids. In 1931, together with Harriet Creighton, she published a landmark experiment showing that genetic crossing-over was associated with the exchange of parts of homologous chromosomes.

These discoveries established her at a young age as a talented theoretician and virtuoso experimentalist, able to perform cytological studies on organisms that others found intractable — her beautiful photographs of chromosomes remain as a testimony to her gifts as an artisan as well as a scientist. These achievements were recognized by her election to the National Academy of Sciences at the age of 42 and, a year later, her election as president of the Genetics Society of America.

McClintock's work during the 1940s firmly established her as a major figure in the history of genetics. It was then that she initiated studies leading to her discovery of transposable elements in corn. The first evidence for these unstable genetic elements came from unexpected results in her continuing research on the fate of broken chromosomes. Her discovery of movable genetic elements, though documented in the same rigorous style as her earlier work, was puzzling to her contemporaries. Yet she was held in such high esteem that her findings were accepted and even codified in genetics textbooks. The prevailing opinion about McClintock's work in the 1950s and 1960s is best exemplified by a comment attributed by Mel Green to the renowned geneticist A. H. Sturtevant. Reporting to a group of interested colleagues at the California Institute of Technology about her talk at the 1951 Cold Spring Harbor symposium, Sturtevant said, "I didn't understand one word she said, but if she says it is so, it must be so!".

Her papers on transposition in maize also contained prescient observations on hitherto unknown epigenetic phenomena, presaging areas of intense current interest such as gene imprinting. She thus leaves fertile ground for a whole new generation of geneticists.

McClintock's ideas about a dynamic genome did not become generally understood until the late 1970s, when transposable elements had been discovered in many organisms and molecular techniques were available for isolation and identification of the DNA segments comprising transposons. In 1983, she received the Nobel prize for her discovery of "mobile genetic elements".

By many accounts McClintock was a very private person. All of her experiments on transposable elements in the 1940s and 1950s were carried out alone at Cold Spring Harbor, where she lived in monk-like austerity. Yet if she was private, she was also very sociable. She was a spirited conversationalist, taking every opportunity for a discussion with younger scientists, who made regular pilgrimages to spend a day with her. Many scientists fondly recall long conversations with her about philosophy, politics and art, as well as science. Children who grew up at Cold Spring Harbor Laboratory remember her as an occasional companion who accompanied them home from the school bus stop, discussing what insects did in the winter or the anatomy of walnuts.

At her ninetieth birthday party, McClintock reflected that it had become more difficult to get to know the summer visitors to Cold Spring Harbor because they whisked in for meetings and then, after a few days, drove away. She relished the days when people stayed for the whole summer, so that she could renew acquaintances or make new ones. For many scientists McClintock was a hero, someone who by her own example helped them find strength in themselves. Her burning curiosity, enthusiasm and uncompromising honesty serve as a constant reminder of what drew us all to science in the first place.

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