



Dorothy Crowfoot Hodgkin

1910 - 1994

Awarded the Nobel Prize for Chemistry in 1964

Dorothy Mary Crowfoot Hodgkin was a famous crystallographer and physical chemist. She received the 1964 Nobel Prize in chemistry for her determination by the X-ray technique of the structure of both *penicillin* and vitamin B_{12} molecules. Later, in 1969, she also discovered the chemical structure of *insulin*.

It is difficult to overestimate the significance of her discoveries. *Penicillin* was one of the early antibiotics which kills bacteria and prevents inflammation. Vitamin B_{12} is crucial in the treatment of pernicious anaemia. The hormone *insulin* controls the level of glucose in the blood, and it is necessary for diabetics. But how can crystallography analyse the structure of such small components as molecules? The answer is that as the X-rays pass between the atoms of the penicillin crystals they are scattered by the electrons surrounding the atoms and are reflected at various angles. The resulting diffraction patterns are recorded on a photographic plate. Directing X-rays from all possible angles one can obtain electron density maps. After mathematical processing of these data the structure of molecules can be obtained.

Dorothy Crowfoot was born in Cairo, Egypt, which was then under British rule. Her father was a notable archaeologist who worked for the Ministry of Education in Cairo. Her mother was a talented amateur botanist and an expert on Coptic textiles. Dorothy was four years old when World War I broke out and, with her younger sister, she was sent for safety to England to her paternal grandmother.

Dorothy was fascinated by crystals when she was still at school. Her parents encouraged her interest and they introduced her to A.F. Joseph, a soil chemist, who gave her a box of reagents and minerals and showed her how to analyse these minerals. Finishing school, Hodgkin attended Somerville College for women at Oxford University. Her aunt, Dorothy Hood, helped to support her financially. In 1932, Hodgkin received a small grant that enabled her to work at Cambridge University with the noted physicist J.D. Bernal. There, she started her research of *sterol* with the help of X-ray crystallography. She received her doctorate, in 1937, on the analysis of *cholesterol iodide*. Most of her professional life was spent in the Department of Mineralogy and Crystallography in Oxford.



*She discussed politics with
Prime Minister
Margaret Thatcher*

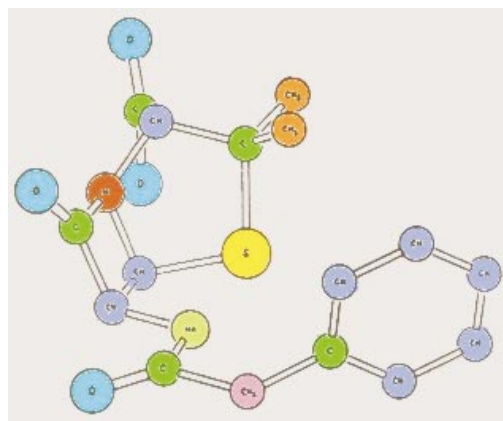
Dorothy Hodgkin was an exceptional person. 'She revealed a unique combination of extraordinary gentleness, shining brilliance, and an iron determination to understand and solve scientific problems'. One of her friends called her 'the gentle genius'.

In 1934, when she was still young, she was diagnosed as having an extremely severe case of rheumatoid arthritis. Her hands and feet gradually became badly crippled. However she continued to work on minute details with high accuracy. At the age of twenty seven she met Thomas Hodgkin, a historian and a warmhearted, good-humored man. They were married in 1937. The couple had three children. She could switch easily anywhere from deep concentration on a calculation to conversation with a child. There is a story that 'when her son Luke started violin lessons and wanted her mother along for the first lesson, Dorothy cut short a grant meeting with a Rockefeller Foundation official, who was charmed'.

In 1965, Hodgkin was awarded the Order of Merit which she received at a private audience with Queen Elizabeth. Margaret Thatcher, who was her former student, sometimes invited her for lunch and they discussed political problems.

Dorothy retired in 1977. Wheelchair-bound she continued to travel to scientific and Peace conferences. She was happy to have nine grandchildren and three great-grandchildren. She died at home in 1994.

*Penicillin
molecule*



She was born in Cairo

