



Leopoldina
Nationale Akademie
der Wissenschaften

Curriculum Vitae

Professor Dr Dorothy Crowfoot Hodgkin

Name: Dorothy Crowfoot Hodgkin

Life Dates: 12 May 1910 - 29 July 1994



Dorothy Crowfoot Hodgkin was a British biochemist. Very early on, she used the emerging field of X-ray crystallography to analyse the structure of biologically relevant molecules such as pepsin, cholesterol, penicillin, vitamin B12 and insulin. She was awarded the Nobel Prize in Chemistry in 1964 for deciphering the molecular structures of important biochemical substances using X-ray crystallography.

Academic and Professional Career

Dorothy Crowfoot Hodgkin studied chemistry in Oxford from 1928 until 1932. In 1933 she went to Cambridge on a scholarship. Here, she also came into contact with the novel technique of X-ray structure analysis. In 1934 Dorothy Crowfoot Hodgkin received a scientific scholarship, which she used for a research stay of several years, first in Cambridge and from 1935 on back in Oxford. There she also began the chemical analysis of insulin. A task whose completion would occupy her up until 1969.

Starting in 1936, she was a natural sciences tutor at Somerville College, Oxford, where she defended her doctoral thesis that same year. In 1946 she became a lecturer in chemistry in the crystallography laboratory. From 1960 to 1977, Dorothy Crowfoot Hodgkin held a chair at Oxford University. From 1970 to 1988, she was also chancellor at the University of Bristol. Her students at Cambridge included the future British Prime Minister Margret Thatcher.

Nobel Prize in Chemistry 1964

During her studies at Oxford University, Dorothy Crowfoot Hodgkin already worked with X-ray structural analysis to determine the lattices and lattice constants of crystals. The method was still relatively new at the time. It allowed elucidating the structure of crystals through X-ray diffraction.

She first began with research on comparatively simple and small molecules. Later, she did important work on analysing the structure of biologically relevant molecules such as pepsin, cholesterol, penicillin, vitamin B12 and, after winning the Nobel Prize, also insulin. Her breakthrough came in 1949 when she published her research on the structure of penicillin. This substance, which had only been discovered in 1929 by Sir Alexander Flemming, who later won the Nobel Prize in Physiology or Medicine, was the most relevant antibiotic against bacterial infections.

Furthermore, in 1956 Dorothy Crowfoot Hodgkin published her study on the structure of vitamin B12, which had been isolated from the liver for the first time just a few years earlier. This vitamin contributes crucially to the formation of red blood cells. It is also involved in the prevention of malignant anaemia. With her Nobel Prize-worthy work, Dorothy Crowfoot Hodgkin decisively improved the method of X-ray diffraction to study morphological structures of crystals. For example, she developed three-dimensional ways of looking at the molecular and atomic structure of complex organic structures.

For this work, Dorothy Crowfoot Hodgkin was awarded the Nobel Prize in Chemistry in 1964.

Honours and Awarded Memberships

Dorothy Crowfoot Hodgkin received numerous other awards, including the Osborne Prize for Research in Biology of Newnham College, University of Cambridge (1937), Royal Medal of the Royal Society London (1956), Order of Merit (1965), Austrian Decoration of Honour for Science and Art, Banting Medal of the American Diabetes Association (1972), Copley Medal of the Royal Society London (1976), and the Lomonosov Medal of the Russian Academy of Sciences (1982). She was a member of scientific associations including the Royal Society London (1947), a foreign member of the Royal Netherlands Academy of Science (1956), a foreign member of the American Academy of Arts and Sciences, Boston (1958) and the German Academy of Sciences Leopoldina (1968).

Numerous universities bestowed honorary doctorates upon her, including Leeds (1959), Manchester and Cambridge (both 1961), Sussex (1965), Hull (1966), Kent (1967) and Harvard (1968).

Personal Details

Dorothy Crowfoot Hodgkin was born in Cairo on 12 May 1910, as the eldest of four daughters to British colonial official John Winter Crowfoot and his wife Grace Mary Hood. As their parents travelled a lot, the children grew up with relatives in England. From 1921, Dorothy Crowfoot Hodgkin attended Sir John Leman Grammar School in Beccles, UK, a town close to the shores of the North Sea in eastern England. At the age of 13, her parents moved to Khartoum, Sudan, and she was permitted to live with them for a longer period of time. Dorothy Crowfoot Hodgkin became interested in scientific

phenomena such as chemical structures at a very young age. After she read a book on the basics of chemistry at the age of 16, she decided to pursue the subject.

In 1937 she married political scientist Thomas Lionel Hodgkin. The couple had three children, Luke (1938), Elizabeth (1941) and Toby (1946). At the age of 24, Dorothy Crowfoot Hodgkin became ill with rheumatoid arthritis, which also caused her hands and feet to become deformed in later years. However, she never let this stop her research work.

Dorothy Crowfoot Hodgkin was a member of the Pugwash Conference on Science and World Affairs starting in 1962 and served as its President from 1976 to 1988. This conference assembled scientists from around the world to discuss global security problems and the issue of the nuclear threat.

Dorothy Crowfoot Hodgkin passed away on 29 July 1994 in Shipston-on-Stour, Warwickshire, UK.