



Women in Science

Dorothy Hodgkin

PRESENTER

Dorothy Hodgkin was a pioneering British X-ray crystallographer. Clare Warren is Post Doctoral Researcher in the Earth and Environmental Sciences Department.

Clare Warren

Dorothy Hodgkin was a chemist, the first British woman to be awarded a Nobel Prize for anything. She was awarded the Prize in 1964 for discovering the structure of vitamin B12 using a technique known as x-ray crystallography, which is where you take photographs of crystals using x-rays. Dorothy is also well known for discovering the structure of insulin and also of penicillin so she was a very influential chemist. Dorothy Hodgkin was born in 1910 in Cairo and spent most of her childhood bouncing around between foreign parts, Khartoum, Cairo, Egypt, where her parents lived and a bit of time at school in the UK. She eventually got to Oxford, to Somerville College, to study chemistry. The only female chemist at Somerville College at the time in the days when Oxford were only allowed to bring in very, very few women and less than a quarter of all the undergraduates at the time. A very, very bright lady who worked incredibly hard. One of the things her friends mention about her in her biography is that she always had to be dragged away from the lab to do anything social or anything fun and sometimes her friends would have to bring food around to her because she'd forget to eat because she got so excited about what she was doing in the lab. So a very, very driven lady.

X-ray crystallography is a technique where you take photographs of crystals using x-rays and you can get little spots on these photographs, which show where the main atoms are in the crystal. So by taking lots of photographs of the crystal from different angles, you end up with lots and lots of sheets that you have to put together and build into a 3D picture so not only have you got to take very high precision photographs, you've also got to have the 3D mental image to be able to put them together and that's what Dorothy Hodgkin had. She had this amazing way of putting together lots and lots of photographs from different angles and seeing the 3D structure from 2D photos.

Dorothy Hodgkin

I got a lot of pleasure myself out of just looking at the photographs and guessing the answers even if I guessed imperfectly and wrong. Well some photographs are really very beautiful you know.

PRESENTER

Dorothy Hodgkin speaking in 1984

Clare Warren

Dorothy Hodgkin's first photograph of insulin she took in 1935 and she was very excited by this 'cause proteins are very hard to crystallise and you've got to make crystals that are at least three or four millimetres big in order to take good photographs but it wasn't until the late 60s until she actually figured out the structure of it. She won her Nobel Prize for the structure of Vitamin B12 which is a very important mineral or crystal to discover the structure of at the time and also for penicillin which is another very, very difficult protein to crystallise. So she was famous not only for getting these proteins to form crystals that she could take photographs of, but also discovering the structure from these photographs. We need to know the structure of it in order to understand how it's used and she was the first person to discover the structure of all of those.

Dorothy Hodgkin

I mean one gets a certain amount of notoriety from being the first person to do things, which anybody else really could have done. What I find difficult to know is why more people didn't come into this particular method of attacking problems at the same stage that we who did come into it [laughter] took it up because it seems to me the chemists and physicists should have realised much more than they did that this was a tremendous opportunity but for those who came in at the earlier stages, of course, there was so much gold lying about [laughter] we couldn't help finding some of it.

Clare Warren

Not only was Dorothy Hodgkin incredibly clever but she also managed to multi task to a way that most women would never be able to, let alone any men being able to. When she first went to university she was looking after her two younger sisters at the same time so she'd have to go home in the holidays and look after them and then when she was at university she was trying to balance learning things for exams plus working in the lab. She had a family with three young children and a husband and managed to do all the household stuff as well as all her high powered research and unfortunately, of course, when she won her Nobel Prize the headlines were mother of three wins £18,750 rather than amazing scientist wins Nobel Prize, which is a bit unfortunate but shows the sign of the times really.

Margaret Thatcher was a student under Dorothy Hodgkin at Somerville College in Oxford and I think they remained in close contact until the end of Dorothy Hodgkin's life. So one of the reasons why I find Dorothy Hodgkin so amazingly inspiring was that she just seemed to get on with everything that was thrown at her. She was working in an incredibly male dominated environment but everyone seemed to respect her intellectual capacity and just let her get on with what she wanted to do and although I'm sure she had to struggle against stereotypes that didn't come through very strongly in some of the books that I've read about Dorothy. It seems as if she just managed to get on with it and get on very well with everybody and didn't push her way through and it wasn't as if people had to let her through either. I think she just dazzled everybody with her brilliance and everyone acknowledged her for that.

Dorothy was at an all women's college in Oxford both for her undergraduate days and also through her fellowship and her working life. Unlike some of her female scientific contemporaries who are working in other institutions like London, for example, Rosalind Franklin, I don't think that Dorothy Hodgkin came across some of the problems that other female scientists of the same time were associated with. She couldn't go to the senior common room dining table and talk with people or go to the smoking room afterwards because that just didn't happen. She was there at an all women's college and they just got on with things. I read her autobiography just as I was finishing my undergraduate degree and I found her life story really inspiring for my future career.

Dorothy Hodgkin

I'm really an experimentalist. I used to say I think with my hands [laughter]. I just like manipulation.

PRESENTER

That was Professor Dorothy Hodgkin speaking in 1984. She died ten years later in 1994.