



## Women in Science

*Marie Curie*

### Opening Montage

I'd like to nominate Marie Curie...The person I'm going to talk about is Mary Anning....My heroine is Rosalind Franklin...I'm going to talk about Gertrude Elles who was a geologist...I'm going to be talking about Dorothy Hodgkin...I'd like to nominate Barbara McClintock as my outstanding woman scientist.

### PRESENTER

The Open University has asked some of the women working at its Faculty of Science today, to each nominate their personal choice of outstanding woman of science.

### Montage

She was a hard worker. She was a meticulous scientist. Generally, she just showed people that she could do the job as well as a man and she got on with it and she did it.

She ended up finding so many amazing fossils that really influenced the understanding of how the Earth was borne.

Persistent and determined and she was a perfectionist and I really, really admire her for that.

To go out into the field, on your own, at that time for Victorian women that wasn't particularly accepted as the thing to do.

I found her life story really inspiring for my future career.

She not only did beautiful scientific work that transformed the way we think about the subject, but she remained dignified under pressure and I think that's why she gets my vote.

### PRESENTER

From antiquity to the present, women have played a crucial role in the development of the sciences. Sometimes their work has been hidden, or credit for it taken by others. But the outstanding female scientists nominated here, illustrate just some of the vital contributions they have made.

One is Marie Curie. 2011 is International Year of Chemistry – commemorating one hundred years since Curie received the Nobel Prize for her discovery of radium and polonium. And she's the choice of Liz Parvin, Senior Lecturer in Medical Physics.

### Liz Parvin

Marie Curie is very well known as an outstanding woman scientist but I think the more that you read about her, the more amazing all her achievements actually seem to be. She was born in 1867 in Warsaw as Marie Sklodowska at a time when the Russians were ruling Warsaw and rather oppressing the Polish. As a young adult she was part of a floating university, a rather clandestine organisation which was organising teaching for young women. Then her elder sister, Bronislawa, went to Paris to study medicine and Marie financed her elder sister for a while by working as a governess in Poland. But then in 1891 she herself went to study at the Sorbonne and studied both physics and then mathematics. While she was studying there she met Pierre Curie who had already done significant work on piezoelectricity, physics and chemistry with his brother, Jacques and so she was married to Pierre in 1895 and rather amazingly [laughter] she wore a black dress for her wedding because it would be practical for wearing in the lab afterwards and they went on their honeymoon on bicycles.

After this she was looking for a research subject to study for her doctorate and it was just about the time when Becquerel in France had discovered radioactivity and she picked on this as a very interesting thing to study and then proceeded to do some amazing work on radioactivity.

#### Reading

“A scientist in his laboratory is not only a technician: he is also a child placed before natural phenomena which impress him like a fairy tale.”

#### **Liz Parvin**

She was a very meticulous scientist, very hard worker and did as I think many people know, an enormous amount of work in isolating both radium and polonium and she also investigated radioactivity. She was one of the early people to believe that radioactivity was actually a property of the atom, it had nothing to do with the chemistry or the temperature or anything like that and she also did some work on the source of heat. Why did radioactive materials get hot?

In 1903 she was awarded the Nobel Prize for physics along with Becquerel and her husband, Pierre Curie, but actually only Becquerel went to the ceremony because neither Marie nor Pierre Curie was very well. Actually we know now that a lot of their illness problems were caused by the radioactivity to which they were constantly exposed at very high levels. Pierre in particular was suffering a lot from problems with his joints and weakness and this may have been a contributory factor when he walked out in front of a cart in 1906, was knocked over and killed instantly. This was, of course, a devastating blow for her and her two young daughters and she had to immerse herself in work really to get over this. She took over her husband's professorship and she was the first woman to become a professor.

In 1911 she was awarded the second Nobel Prize in chemistry. She started to establish her own lab, an institute in Paris, to do lots more work on radioactivity and this was completed in 1914 just as the First World War broke out.

She realised that x-rays were going to be very important in diagnosing wounded soldiers in isolating where the bullets were in their bodies. She went around a lot of her contacts, raised a lot of money and actually over the course of the War managed to put together something like 200 vans which went out into the battlefields x-raying soldiers, pointing out to the doctors where the bullets actually were and she was accompanied in this by her daughter who was only 17 at the beginning the War. She actually trained young women to be what we would now call radiographers to actually go out with these vans and do the radiography and do the x-rays.

She was keen on the idea that radium could be used to cure cancers and very early on, about 1905, people started to use radium to cure cancers. We don't actually use it today because there's all sorts of problems with radium, like its long half life but there are nowadays much better radioactive materials that are used for radiotherapy but the work that she did led an enormous amount of ground work in radioactivity, in developing radioactive series, in understanding things like radioactive half life and so on which is absolutely essential to the work that's done today in modern radiotherapy.

Over a very long period she suffered from the effects of radiation and eventually she died in 1934 from those effects of radiation, actually at a sanatorium in Switzerland. But at that time nobody really understood the damage that they were doing to themselves. They were very cavalier about it in the laboratory, felt that a few days out in the fresh air would sort things out and they were handling these incredibly intensive radioactive sources for such a long time, breathing in radon, which is emitted by radium and is known to be very harmful. She actually had two daughters both of whom she carried during the time that she was working with radiation and it doesn't seem to have had much of an effect on them at that stage. In her 50s she suffered from cataracts, which are now well known to be an effect of ionising radiation so I just find it amazing that she actually lived well into her 60s.

I think she's a scientist to be admired. A woman scientist to be admired because she was a hard worker, she was a meticulous scientist. Generally she just showed people that she could do the job as well as a man and she got on with it and she did it.