

Driven to Diffraction
The Story of William and Lawrence Bragg
South Australian Film Corporation, 2009, 55 minutes

At the instigation of the South Australian Department of Premier and Cabinet, The South Australian Film Corporation has made two documentaries of what is intended as a series to highlight the global significance of scientists with strong connections to South Australia. This is a worthwhile and noble endeavour, not just to prevent current generations from forgetting our eminent forebears, but also to ignite young minds to pursue science as inherently rewarding and as a career in its own right.

It is with a feeling with awe that we examine the new science
(William Bragg).

This lecture length documentary is ideally suited to whet the scientific appetites of teenagers. It stars a father and son team whose innovations started in Adelaide and who ended up making discoveries of global significance. They went on to be the so far only father and son team to be awarded the Nobel Prize in Physics in 1915. William Bragg (1862-1942) and Lawrence Bragg (1890 – 1971) span several generations during which they made several contributions to science, as a result of which no fewer than 30 Nobel prize-winners benefitted from adding to the body of Xray crystallography and spectroscopy.

While Sir William Henry Bragg was born in England, he took up a professorship in Mathematics and Experimental Physics at the University of Adelaide in 1885, and his first of three sons was born 5 years later in that city. The documentary is narrated by an actress parading as Gwendolyn, William's wife. Her rendition adds to the human story that reminds the audience that not all scientists are nerds:

They were ordinary people who looked behind problems that looked too difficult to solve, and found the answers lay in the beauty and simplicity of nature.

A surprising feature of the Bragg lives is how many lives of famous scientists intersected with theirs. In 1896 Röntgen discovered the X ray and father Bragg recognised this "new photography" by telling his son bedtime stories of hydrogen and proceeded to work his way through the entire periodic tables while talking his son to sleep.

Lawrence Bragg was accelerated ahead of his age and joined Adelaide University to study mathematics, chemistry and physics at the age 15. Biographically, the documentary acknowledges that his emotional maturity was not up to the same age. It was not until he accompanied his dad and learned of Marie Curie's work in radioactivity that Lawrence made friends with Cecil Hopkinson and began to enjoy adventures. The documentary engages oral contributions from eminent scientists from around the world who attest to the significance of the several Bragg discoveries.

William Bragg was made Fellow of the Royal Society in 1909 and became Professor of Physics at the University of Leeds, where he succeeded Ernest Rutherford in the famous Cavendish laboratories. Using simulation now possible thanks to contemporary computer generated animation of particles, the film celebrates the wonder of scientific literacy:

That's the beauty of scientific method. Try not to get stuck in old ideas too much, and let the facts speak for themselves.

Arguably the most significant Bragg discovery, the X-ray spectrometer, changed molecular science forever. Röntgen, Curie, Rutherford, Einstein and James Watson of DNA fame all interacted with the Braggs, who turned the Royal Institute of Great Britain into promoting science for a wider audience. The Braggs diffused science for the common purposes of life.

Don't talk to students about science: show it to them
(Lawrence Bragg).

The Braggs lived an enthusiasm and genius for models of radio astronomy, and their work, methods and contributions are testament to what was a glorious time of discovering new medicines, medicines that now held unprecedented diagnostic powers. The Royal Society has only one franchise branch outside of England, in Adelaide. The Braggs lived a life across the English-speaking world and made an immense contribution to science. Students of science in Australia need to understand and acknowledge their contribution.

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