

Destiny Jenkins

Period 2

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Physics Extra Credit Essay

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William Lawrence Bragg

The Nobel Prize was established by an eighteenth century scientist by the name of Alfred Nobel. Before he died, he established in his will that ninety-four percent of his earnings go to creating the foundation so that all great discoveries that affect the world are nationally recognized. Nobel donated close to two hundred million dollars to establish prizes for physics, medicine, literature, chemistry, and peace. The physics Nobel Prize is awarded by the Royal Swedish Academy of Sciences. The winner receives a gold medal and money that is to be split if more than one person is sharing the Nobel Prize for a single accomplishment. Many incredible physicists have won the Nobel Prize due to hard work and dedication to their passion and curiosity. However, the most inspiring and incredible story is that of the youngest-to-date winner, William Lawrence Bragg. He won the Physics Nobel Prize for analysis of crystal structure by means of X-rays. Although the prize was won jointly with his father, William Henry Bragg, it is Lawrence Bragg who shines as the star of this life-changing achievement.

Lawrence Bragg was born on March 31, 1879 in Adelaide, South Australia with an incredible infatuation of science, naturally, being born into a science-filled life due to his father's similar love for science. Considering the fact that his father had already established himself as a well-known scientist because of his hard work, many believe that

Henry Bragg is responsible for the discovery. Some say that he is just being nice by letting his son share the title because of a little help. However, it is known that Henry Bragg is not one to let others have the limelight easily. At the ripe young age of nine, Lawrence Bragg found an endangered species while outside at a park, and Henry Bragg intervened to make sure that the creature was not named after his young son, rather than himself. The father and son did not have a close relationship, like he had with his mother who died while he was young. This did not let the young scientist stop him from pursuing his passion and dedicating himself to his work. By age eleven, he was so recognized for his unique talent and love that he was placed in college. He studied at multiple colleges, with St. Peter's, Adelaide University, and Trinity being the most significant. He grew interested in the work of Max von Laue, and curious why he was unable to explain by clear theory the atomic architecture of the crystals he observed.

Working with his father, using the recently invented X-ray to experiment with trying to see the atomic structure of the crystals, they soon came up with Bragg's law, $n\lambda = 2d \sin \theta$ the equation that links the wavelength of x rays with the distance between two crystal planes and the angle of incidence. This is considered one of the biggest discoveries in the twentieth century because it makes it possible to calculate positions of atoms in crystal structures by observing the way in which the X-ray beam is deflected by the crystal's array of atoms, patterned orderly. With this, they demonstrated that the behaviors and properties of many substances could be directly related and due to the atomic placement. This discovery made a world of difference to scientist studying topics of similarity. Although Bragg is not responsible for the discoveries of scientists like

James Watson, he admits that 'the X-ray method Bragg developed forty years before was at the heart of this profound insight into the nature of life itself.'

Most of the work done that led up to the final results and success of the Bragg family was done by Lawrence Bragg at college and other laboratories that allowed him to experiment there. Even though he served in both World War One and World War Two, he held the laboratories to make sure he could continue his work when he returned home from war, in which he worked in the scientific department to trace enemy weapons and guns with radar. Davy Faraday Laboratory of the Royal Institute and Cavendish Laboratory, Cambridge are the two main locations of Bragg's early work. He was later knighted, as his father was around his age. Much work was done later on at his father's place, where the available equipment resided. The producing of the equipment to enable experimenting and discoveries was the main role of Henry Braggs in this project, while Lawrence Bragg did the rest of the research.

From the time Lawrence Bragg was beginning his developing interest with this topic in 1913, he continued to work with it and build on to many great ideas until he finally retired in 1966. He was getting old, and had a family. He married Alice Grace Jenny in 1921 and together they had four children, two boys, and two girls. Each of their children were successful as they grew older. Both of his boys followed in his scientific path, and the girls married successful men. Bragg's hobbies included painting, literature and a life-long interest in gardening, a well-rounded man to say the least. William Lawrence Bragg passed away on July 1, 1971. He would not be forgotten, however. Throughout his lifetime, not only did he make a huge difference in the expanding scientific economy, but he made a difference everywhere else, as well. He suggested for

the first time of any Nobel Prize winner, that he and the foundation travel to students around the world to educate them on the discoveries and to inspire them to work for what they want. Bragg won multiple awards and was also given countless positions in organizations and honored all over by not only companies, but individual persons as well.

In conclusion, William Lawrence Bragg worked from the time he was a young boy until many years past winning the Nobel Prize at age 25, to research and experiment with science, coming up with helpful formulas like Bragg's Law. He won jointly with his father, who did the mechanics, like building the equipment. Bragg's discoveries made for an easier scientific world, trying to look inside of molecules to see atoms. It is understood now, why substances react and behave the way they do, thanks to the atomic structure. Bragg has been remembered to this day, and will continue to be remembered not only for his brilliant mind and hard work, but also for his love and passion for it, so much so that he took his work to the road to educate children.