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Period 1

Enrico Fermi

Enrico Fermi earned the Nobel Prize Award in the category of physics in the year of 1938. He played a major role in the Manhattan Project, in which the nuclear bomb was first invented, along with another famous physicist, J. Robert Oppenheimer. Many know of him today as the “father of the atomic bomb”; however, his life’s work was not confined to just the atomic bomb, as he broke new grounds in quantum and nuclear physics. His contributions to the study of radioactivity, specifically induced radioactivity led to him winning the Nobel Prize. Without Fermi, nuclear reactors today would not exist, whether for better or for worse.

Enrico was born in Italy to Alberto Fermi, an employee of the Italian Ministry of Communications, and his wife, Ida de Gattis. From a young age, Fermi excelled in mathematics. With the nudging of his father, he discovered his true talents in physics, and would later attend the University of Pisa, a prestigious university at that time. Four years later, he earned his doctorate in, surprisingly, physics.

In the following years, Fermi was given a scholarship from the Italian government and worked with many notable or would be notable scientists, including Max Born, the Nobel Prize winner of 1954 in physics. He later would take the position of Mathematical Physics and Mechanics Lecturer at the University of Florence. Two years later, in 1926, Fermi would discover statistic laws that govern fermions, or particles subject to Paul’s exclusion principle.

In 1927, Enrico took up the post of Professor of Theoretical Physics at the University of Rome. While he worked for the University of Rome, Fermi researched many different subjects, all dealing with the atom, before focusing on the nucleus of an atom. His experiments and research helped to redesign the theory of beta decay. In 1934, artificial radioactivity was discovered by the famous Mario Curie and Frédéric Joliot, which allowed Fermi to find conclusive evidence of nuclear transformation occurring in all atoms when their atoms are bombarded by neutrons, slow neutrons, and nuclear fission.

Nuclear fission showed that elements outside the ones on the periodic table could be made. Later that year, he was awarded the Nobel Prize for his research in induced radioactivity, and promptly left Italy for the United States. Enrico has stated that he left due to the fascist regime at this time, and its leader Mussolini.

Up until the time period before the intervention of the United States in World War II, Fermi worked at Columbia University as a Professor of Physics. As fission became clearer, Enrico realized that there was a possibility of a secondary neutron emission and a following chain reaction. When he joined the Manhattan Project, Fermi worked with a dedicated team of physicists, and designed the first controlled nuclear chain reaction, the source of the destructive powers of an atomic bomb.

On July 16, 1945, the testing of the first nuclear weapon, “Trinity”, succeeded in the deserts of New Mexico. Less than a month later, the Enola Gay dropped the atomic bomb on Hiroshima. With the success of the Manhattan Project, Fermi finally obtained his American citizenship, and was naturalized. Soon after WWII had been declared over, he took the job of Professor of Nuclear Studies at the University of Chicago. He worked there from 1946 until 1954 when he eventually died; leaving a mark on the world that is still visible today.

Enrico has stated that the source of his motivation was the death of his older brother, Giulio, as the two had a close relationship, enjoyed the same things, and worked together. Giulio had fallen ill with a throat ailment, which led to his death, and at the age of 14, Enrico Fermi drowned himself in his schoolwork as an escape. From that day on, he started on a journey to his eventual success and fame in ideas that were entirely theoretical for the time period.

Another notable fact is that he was at his prime during a time period when scientists were in great demand. Funding for his work was easily supplied by the government. World War II created an intense competition between opposing countries, and even their allies. Fermi may have been forced to develop his ideas into a weapon, but without the funding from the government, he may never have had the same opportunities or achieved the same results. He gave the world a new source of energy, which is prevalent in this day and age.

His defection from Italy was crucial to the Allied victories of World War II, as Germany was looking for scientists and attempting to design weapons similar to the atomic bomb in the midst of the war. Albert Einstein, a refugee from Nazi Germany, had persuaded the United States to look into the creation of a weapon of mass destruction. He stated that it was required if the United States wanted to counter the Axis. Soon after, the Manhattan Project was conceived.

Although he received a multitude of awards and prizes, the one that stands out the most is the Nobel Prize Award. As said before, he won this in the category of Physics due to his discoveries of the ability to create new elements that lay outside the periodic table of that time period, or the creation of synthetic elements. He came across this as he subjected the nuclei of atoms to barrages of neutrons, and recorded the results for each element. This not

only expanded the periodic table, which would eventually contain the element Fermium, but it led to his discovery of nuclear reactions in slow neutrons.

As he was awarded the Nobel Prize for both of these discoveries, the direct result of his research was the nuclear reactor, which opened up a whole new world in alternative energies.

In summary, Enrico Fermi was an incredible physicist who not only created the strongest weapon known to man, but invented an alternative energy source for the betterment of mankind. His legacy shows in many ways today, from the names of power plants in New England, to the Fermi Award. His innovations opened the world up to synthetic elements and revolutionized warfare. One could safely say that he made his older brother proud, and the tragedy of Enrico's death marked the end of an era, but the start of new, the Nuclear Era.