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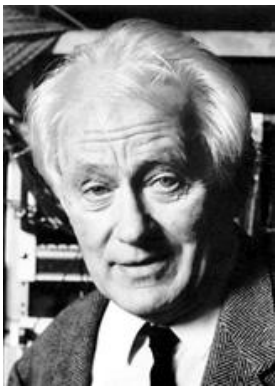
Period 1

Georges Charpak

Born in Dabrovica, Poland on August 1, 1924, Georges Charpak would become a man to revolutionize the detection of particles. Winning the Nobel Prize in Physics in 1992, he has been credited with many discoveries as well as founded and/or sponsored many organizations. He was born into a loving family, with parents by the name of Maurice Charpak and Anna Szapiro, Charpak. His family decided to move to Poland when he was just seven years old; he would later find out this would be the perfect place to continue his amazing career as a physicist. This brave man fought in one of the two horrifying world wars and was sent to the Nazi concentration camp known as Dachau. Freed in 1945, Charpak continued his schooling at the Ecole des Mines, located in Paris, to receive a civil engineering degree. His schooling was only beginning, as he quickly decided to complete graduate school at the College de France, also located conveniently in Paris. He took part in several different clubs and organizations that focused on the study/interest of science. His love for physics and science as a whole was evident from the time he began his schooling. From here, he studied nuclear physics with world-renowned physicists only to launch his life-changing career.



Charpak traveled the world delivering powerful lectures concerning his studies and recent topics of interest. When lecturing in Padua, a local physicist Lederman took interest in Charpak's intellectual speech. He seemed to be just the man him and his colleagues had been looking for to help with their most recent experiments. So, after a welcoming invite, Charpak agreed to study with Lederman at CERN, a laboratory that dealt with particle physics, in Geneva, Switzerland.

Photographic recording proved to be the latest discovery at the time; however, more times than not, the process was agonizingly slow and difficult to analyze. Only a few physicists in the area understood the depth this process possessed. This elevated process was used in two other important inventions, the bubble chamber and the cloud chamber. Bubble chambers were developed to aid physicists in viewing particles and their movement. Similarly, the cloud chamber functions as a viewing device also in that it is able to detect the exact patterns of particles through the radioactive decay they emit. Although these two inventions were used worldwide, many sought to find a simpler, perhaps easier way of analyzing the movement of particles. And so the search continued.

After long hours of grueling work on different ways to detect particle movement without the use of photographic recording, Charpak devised a new chamber that is commonly referred to as the spark chamber. The function of this new device is similar to that of the cloud and bubble chamber; however, it completes the task without the complicated use of photographic recording. Its construction is fairly simple too.

Metal plates are carefully positioned closely in an enclosed box that is affected by high voltage power. A strong field of electricity is created within the plates as they are spatially very close to one another. The box is filled with gas and closed so none can possibly escape. Particles from the electrical cloud with begin sporadically moving around the sealed box and "ionize the gas between the plates." Subsequent to this high-speed particle movement, another wave of high voltage power darts through the plates, in turn, producing an illustration of the path of the particle. What causes the chamber to sense the movement of microscopic particles?

"Two scintillators coupled with a photomultiplier tube" are placed above and below the box. When there are similarities experienced in both parts, a high voltage shock is sent through the box, thus creating a clear drawing of the journey particles take within seconds.

This work conducted at the laboratory of CERN can be directly linked to Charpak's awarding of the Nobel Prize in Physics. Unlike many other years, he was the only man to be awarded this prize that year which further exemplifies his incredible intelligence and discovery. He completed his studies prior to 1922 when he was awarded this honorable award. During this same time period (1920s) no significant other discoveries were made that can be directly correlated with Charpak's important breakthrough; however, in 1921, just one year before Geroges was awarded with the same award, Albert Einstein was recognized as a Nobel Prize winner in the physics category as well. This may have sparked Charpak's interest in producing a world-changing advance. Furthermore, this invention was created during the period of time that directly followed the end of World War I and the entrance into the Great Depression. The debate between science and technology was prominent during these years and many questioned the latest discoveries backing up controversy with facts from the Bible.

Many physicists and critics ponder why Charpak took interest in this particular topic, and many relate it to his love for particle physics and a desire to create the next greatest invention for the world that would change the study of physics as the world knew it. Moreover, many suggest that Charpak may have only discovered this because of the gracious invite from CERN. Without this opportunity, laboratory, and ample amount of fellow workers, Charpak may have taken a different path in the study of physics and perhaps discovered something else groundbreaking.

Georges Charpak went on to make further discoveries and perform a numerous amount of successful experiments. His love for particle physics never burned out; however another fire was

ignited within him that led him to gravitate toward aerospace and medicinal problems. Turbine blades, used for aeronautical purposes, were an enigma to most before Charpak took the honor of discovering a way to create an "X-ray radiograph" which would help in the construction of future contraptions and parts. Furthermore, his interest in medicine and health led him to another discovery that dealt with X-rays. This one gave birth to high-speed X-rays able to study proteins and their structures and functions. This has led to a plethora of discoveries made by other scientists, doctors, and even physicists. It was recorded that before this great physicist died, he had plans of developing a way to detect brain receptors.

Charpak died recently on September 29, 2010 at the age of eighty-six. He was a man respected by all and one that will be remembered for the abundance of knowledge he shared with the world and his contribution to the science and physics community. He co-wrote a novel titled *Megawatts and Megatons: A Turning Point in the Nuclear Age?* before he died that has been read by several scientists and common people. His legacy will live on through generations to come and has paved the road for many flourishing physicists eager to leave their mark on the world.

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