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History Leading To The Creation of The Atomic Bomb

Atomic science began many centuries ago with experimenting and probing into the nature and structure of matter. This began with ancient philosophers and alchemists. Science began emerging with Thales of Miletus (634-546 BC), the Ionian Greek, who described the power of attraction in electricity long before electricity was known.

Democritus (460-370 BC), a Greek philosopher was called the "father of the atom." Although he had no experimental evidence to support him, Democritus argued that all matter must consist of a number of fundamental pieces. He called these pieces "atoms" for the Greek word "atomon," which actually means indivisible. In 79 BC, the Roman poet-philosopher Titus Lucretius (98-55 BC) developed atomic theory.

After the downfall of the Roman Empire and throughout the Middle Ages, the theory of the atomic view of matter was almost lost. Then, the seventeenth century brought the age of Galileo. Galilei Galileo (1564-1642), through his observations of falling objects and controlled experiments is regarded as the father of modern physics. The eighteenth century produced Sir Isaac Newton, with his physical laws. Man's conception of the universe around him was changing.

John Dalton (1766-1844), an English chemist, developed the first useful atomic theory of matter around 1803. Amedeo Avogadro (1776-1856), the Italian chemist, who in 1811, published an article drawing the distinction between the atom and the molecule which is now known as "Avogadro's Principle." Jons Berzelius (1779-1848), a Swedish analytical genius and disciple of Dalton who undertook the measurement of atomic weights.

Michael Faraday (1791-1867), a great proponent of experimental science, laying the foundation of electro-technology. James Clerk Maxwell (1831-1879), a Scottish physicist, stated that atoms were the foundation stones of the universe. Lord Kelvin (1824-1907), a practical English genius, who systematized knowledge of mechanics, electricity, and heat in formation of the laws of energy. Dimitri Mendeleev (1834-1907), a Russian teacher and discoverer of the periodic system of the elements, who opened new areas of atomic knowledge.

William Konrad Roentgen (1845-1923), a German professor, whose discovery of X-rays provided for science a revolutionary tool. Antoine Henri Becquerel (1852-1908), the French experimentalist, who discovered the phenomenon of radioactivity. Max Planck (1858-1947), of Germany, who established the law of radiation, which led to the theory of quanta and the modern understanding of the electronic structure of matter. The parents of nuclear physics were the French team of Pierre and Marie Curie. From them came the realization that the atom has a core, or nucleus, quite different from the shell of the atom.

It became apparent that the nucleus is governed by different laws of physics. Concentrating in the atomic field, were great laboratories, like the Cavendish Laboratory of Experimental Physics, at Cambridge, England. Here worked Sir J.J. Thomson, who in 1897, discovered the electron, and his pupil, a pioneer of atomic exploration, Lord Rutherford. From Lord Ernest Rutherford (1871-1937) came the discovery of the proton. He was the first to disintegrate the nucleus and established the character of radium emissions and suggested what the true nature of the atom might be.

Max von Laue (1879-1960), of Germany, interpreted the crystalline structure of matter, clue to the secrets of atomic structure. In 1905, Albert Einstein (1879-1955) wrote the mass-energy conversion equation. Sir James Chadwick, a student and co-worker of Lord Rutherford, in 1932, discovered the third fundamental particle of the atom, the neutron. This would provide an ideal projectile for splitting the nucleus of the atom.

The final clue to the discovery of the neutron and atomic energy was supplied to Chadwick by Frederick Joliot and his wife, Irene Curie-Joliot, who had observed a peculiar property of the radiation emitted when beryllium is bombarded with alpha particles. Enrico Fermi, an Italian physicist, in 1934, bombarded uranium with slow neutrons and created new elements. Niels Bohr, Danish physicist, is chiefly responsible for the planetary conception of the atom.

In 1938, the discovery of fission of the uranium nucleus by neutron bombardment. Leading names in this research carried out in Germany, were Dr. Otto Hahn and Dr. Fritz Strassmann. In June 1940, President Roosevelt organized the National Defense Research Committee. The Uranium Committee became a part of this group, reporting to Dr. Vannevar Bush. Dr. Bush and the National Defense Research Committee determined on an all out effort to develop an atomic bomb.

Under the direction of Major General Leslie R. Groves, the Manhattan Engineer District (the Manhattan Project), a new branch of the Army's Corp of Engineers, was established to administer work on military uses of uranium. On December 2, 1942, the first self-sustaining chain reacting pile was successfully operated at the university of Chicago by Enrico Fermi.

This success brought authorization for construction of the Clinton diffusion plant at Oak Ridge, Tennessee, and the giant plutonium producing plant on the Columbia River at Hanford, Washington. The Oakridge plant was designed to concentrate U-235, one of five known isotopes of uranium while the Hanford plant was the source of a new, man-made element, Plutonium. Dr. J. Robert Oppenheimer arrived at Los Alamos in March 1942 to take charge of the development of the atomic bomb.

From Los Alamos came the design of the implosion bomb and treatment of many theoretical problems. Methods of purifying materials to be used were developed. Finally, in July, 1945, a practical atomic bomb was completed. On July 16, 1945, the first test, code named "Trinity" was exploded at Alamogordo, New Mexico.

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