Anselme Payen Biography

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Biography

Payen was the son of an entrepreneur who had started several chemical production factories. Payen studied chemistry first with his father and later with Nicolas Louis Vauquelin (1763-1829) and Michel-Eugène Chevreul (1786-1889).

In 1815 Payen was promoted to head of his father's borax production plant. While there Payen discovered a method of preparing borax from boric acid which was readily and cheaply available from Italy. Because production costs for this method were very low, Payen was able to undersell his competitors, the Dutch, who until that time had a monopoly on borax.

Five years later Payan began investigating the production of sugar from sugar beets. He developed a process in which charcoal was used to decolor the sugar. Charcoal filters were later used in gas masks since carbon filters absorbed dangerous organic gases. Payan continued his research and in 1833 developed a chemical from malt extract that catalyzed the starch-to-sugar conversion. He named the organic catalyst diastase, which was the first enzyme produced in concentrated form. Enzymes discovered since then are named with the *ase* suffix, the pattern started by Payen.

Payen went on to study woods and during his research began to separate out a substance resembling starch. He named this substance, which he found in abundance in the cell walls of all the plants he studied, cellulose. Again, Payen established a naming system: carbohydrates end with *ose*. Although Payen was the first to isolate cellulose, it was not until the late 1930s through the work of Wanda Farr that it was discovered how plants produce this carbohydrate.

Cellulose, a natural polymer, was the building block of many other inventions. Treated with various acids and additives it became the main ingredient in nitrocellulose, guncotton, collodion, rayon, celluloid, cellophane, and many other products.

In 1835 Payen accepted a professorship at the Ecole Centrale des Arts et Manufactures and concentrated exclusively on research. He died in Paris during the Franco-Prussian War in 1871 after refusing to leave the city as the Prussian army advanced.