Pierre-Joseph Pelletier Biography

Pierre-Joseph Pelletier

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Biography

A pharmacist from a family of pharmacists, Pierre-Joseph Pelletier is known for his research into vegetable bases and the resulting contributions of alkaloid chemistry to the field of medicine. Working with Joseph-Bienaimé Caventou (1795-1877), he introduced a rational basis into alkaloid chemistry.

Pelletier began his research in 1809, became a pharmacist in 1810, received a doctor of science degree in 1812, became a professor at the École de Pharmacie in Paris in 1825, and became the school's assistant director in 1832. He experimented with gum resins and coloring matter in plants. In place of the harsh distillation methods of extraction common in laboratories at the time, he used the milder method of solvent extraction. Inspired by the German pharmacist Friedrich Sertürner's (1783-1841) investigations into poppy extracts (from which the analgesic drug morphine is derived), he began to examine the newly discovered class of vegetable bases, or alkaloids.

Alkaloids are organic compounds which contain carbon, hydrogen and nitrogen and which form water-soluble salts. They perform a variety of functions in medicine; for example, some are analgesics (pain-killers), and others are respiratory stimulants. The study of their chemistry provided the groundwork for further chemical discoveries.

In 1817, Pelletier and the French physiologist François Magendie isolated the alkaloid emetine. Pelletier began to work with Caventou, isolating chlorophyll in 1817, strychnine in 1818, brucine in 1819, quinine in 1820 and caffeine in 1821. They demonstrated that alkaloids contained oxygen, hydrogen and carbon, but did not believe nitrogen was present until 1823. Then, using elementary closed-tube analyses in which the alkaloids were combusted, they discovered that nitrogen was present in the compounds.

As medicine quickly found a place for alkaloids, a shift occurred in the field. Instead of crude plant extracts, chemists began to isolate and produce natural and synthetic alkaloid compounds for medicinal uses. For example, the bark of the cinchona tree had long been used in the treatment of malaria, but Pelletier and Caventou's isolation of the alkaloid quinine from this bark made the pure drug available, and eventually led to the synthesis of the drugs used to prevent malaria today. Their isolation of quinine earned Pelletier and Caventou the Montyon Prize from the Academy of Sciences.

Pelletier was admitted into admitted into the Academy of Sciences in 1840 and retired the same year due to illness. He died in 1842.