

The Life of Jean Baptiste Andre Dumas

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Chemistry 113 Honors Project

Monday, Wednesday, Friday:
10:40am

November 21, 2003



Jean-Baptiste-André Dumas, engraving, 1879
Boyer—H. Roger-Viollet
Encyclopædia Britannica

Jean Baptiste Andre Dumas was a student of LJ Thenard, he was an organic chemist, “prolific experimentalist and leading theorist,” in the controversies of organic chemistry in his day, his fascinating life began on July 14, 1800 in Alés, Gard and died on April 11, 1884. (Biographical Encyclopedia & Chemists) Jean Dumas was a devout Catholic throughout his life and “remained true to his faith.” (Jean-Baptiste Dumas). He was French and received his education at the college of Alais. He intended to join the navy after college, but since Napoleon was overthrown, he changed his mind and became an “apothecary’s apprentice.” (Greenaway) An apothecary is a pharmacist so an apothecary’s apprentice is someone training to become a pharmacist. (Pharmacy)

Dumas went to Geneva for better job prospects after college and worked with A. Le Royer in 1816, J.F. Coindent, where he concentrated on; hysiological chemistry, he studied, “the use of iodine compounds as a cure for goiter.” “Greenway) Goitre is the enlargement of thyroid gland. (Thyroid) Dumas also worked with J.L Prévost in his early years “on muscle action blood corpuscles.” Greenaway) He also studied blood and proved that the function of the kidneys “is to remove urea from the blood, not to produce it.” (Biographical Dictionary) His

career improved when Alexander von Humboldt urged him to work in Paris. This would then lead to many opportunities.

Once in Paris, Jean became the “lecture assistant to L.J. Thenard at *École Polytechnique*.” (Greenaway) He was the “cofounder of *Annales des sciences naturelles*” in 1824, he became the “editor of *Annales de chimie et de physique*” in 1840. (Concise) He then began his important work on *Traite de Chimie* and in 1829 he founded the *École Centrale des arts et manufactures*, a school of chemistry. He also influenced Duruy officially “to recognize the importance of scientific laboratories” by endowing and uniting them administratively “under the name *École Pratique des Hautes études*,” which means the Practical Institute for Advanced Studies. (Jean) In 1835, he “succeeded Thenard as Professor of Chemistry at the *École Polytechnique*.” (Greenway) In 1841, Dumas held professional posts at Sorbonne and *École Médecine*. (Greenway) He also taught at Collège de France and private classes as well. (Concise) Dumas was also involved in politics during his life.

Not only was Dumas a chemist, but he was also “active in politics,” from 1848 on. (Concise) He became a member of the Institute of the Academy of Sciences in 1832. (Jean-Baptiste Dumas) In 1849, Dumas was “elected deputy from the department of Nord.” (Jean-Baptiste Dumas) Under Napoleon III, Dumas served as Minister of Agriculture & Commerce in 1851, “Minister of Education, and Master of the Mint”. (Jean-Baptiste Dumas & Chemists) He was also the permanent Secretary of the *Académie des Sciences*, in 1878, he became a member of the French Academy. After Napoleon’s “deposition” in

1871, Dumas abandoned politics. (Chemists) Dumas made many findings in his research.

Dumas made many discoveries as a chemist. In his early years, he “isolated anthracene from coal tar, and studied the essential oils,” so he obtained the formulas for methanol, camphor, and other related substances. (Greenaway) Dumas also attempted to classify organic compounds by utilizing theories of electrochemical dualism and atomism. (Concise From 1827-1828, he studied ether and alcohol and concluded that “both were hydrates of ethylene, alcohol containing twice as much water as ether did.” (Concise)

In 1834 with Eugène Peligot, he discovered methanol. (Biographical Encyclopedia) Dumas also “recognized that methanol was different from ethyl alcohol by one CH_2 group...this subsequent discovery that Chevreul’s “ethyl” was cetyl alcohol (1836) led Dumas to conceive the idea of a series of compounds of the same type.” (Biographical Encyclopedia) This was very important because this led Charles Gerhardt to the concept of homologous series. He also found a great method for finding vapor densities in 1826, which led to the atomic weights of oxygen and carbon. (Jean Baptiste Andre Dumas) Dumas was the first to compare families of elements with families of homologs of organic chemistry. (Jean-Baptiste Dumas (1800-1884))

Dumas began working with atomic theory in 1826. He found the “molecular weights of many substances by measuring the vapor densities.” (Biographical Dictionary) Dumas “concluded that “in all elastic fluids observed under the same conditions, the molecules are placed at equal distances” – that

is, they are present in equal numbers.” (Chemists) A monumental moment in his scientific career was when he determined the atomic weight of carbon with J.G. Stas in 1849, but he had actually worked with Stas prior to this occasion when he was his student and they were studying the “action of alkalis on alcohols and ethers” this then lead to an examination of “the acids produced by the oxidation of alcohols.” (Chemists) In 1840, he did thirty important revisions of atomic weights of elements. (Concise) At this time the atomic weight of Carbon was thought to be 12.24, but dumas revised it to 12.02. He also tried to classify elements and “to find “generating” relations similar to those defining of organic compounds.” (Concise) So about 30 years before Mendeleev was group elements together Dumas was. A monumental moment in his scientific career was when he determined that atomic weight of carbon with J.G. Stas in 1849. (Greenaway)

Another great work was his substitution theory. This came about from candles being bleached with chlorine, which “gave off fumes of hydrogen chloride when they burned.” Dumas concluded that “during the bleaching the hydrogen in the hydrocarbon oil of turpentine became replaced by chlorine.” (Biographical Encyclopedia) This caused quite an up stir since it opposed the theory of J.J. Berzelius and J. L Gay-Lussac. (Greenaway) The substitution theory then lead him to other theories in 1840, “similar to the modern concept of functional groups,” but credit is disputed between Auguste Laurent and Dumas. (Biographical Encyclopedia)

Dumas also created a method for “the estimation for the amount of nitrogen in an organic compound.” This then lead to the “basis of modern methods of analysis.” This is done by taking a sample of nitrogen, of known weight, and then eliminating it, in gaseous form. It is then “estimated by direct measurement.”

The sample is then heated with “copper oxide (copper oxide (copper(II) oxide) and oxidized completely in a stream of carbon dioxide; the gaseous products of the combustion are passed over a heated copper spiral and the nitrogen collected in a gas burette over concentrated potassium hydroxide solution. (Chemists)

This is the procedure for estimating the amount of nitrogen in an organic compound.

Jean Baptiste Andre Dumas was an important chemist that had a huge impact on chemistry because of his work. He will not be easily forgotten. His work is still seen today, the atomic weight of Carbon is still close to 12.02.

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