



PARA QUITARLE EL POLVO

William Prout



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PALABRAS CLAVE

Digestión;
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Orina;
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Fluido gástrico;
Hipótesis de Prout

Abstract William Prout (1785-1850) a multifaceted English physician, conducted important research in the areas of physiology, meteorology, and chemistry; he studied the processes of digestion, respiration, and blood formation, the urinary system, urine and urinary calculi, identified the presence of HCl in the gastric fluid, and proposed the theory that the atomic weight of an element is an integer multiple of the atomic weight of hydrogen (Prout's hypothesis).

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William Prout

Resumen William Prout (1785-1850), un médico inglés multifacético, realizó importantes investigaciones en las áreas de medicina, fisiología, meteorología y química; estudió los procesos de digestión, respiración y formación de la sangre, el sistema urinario, la orina y los cálculos urinarios, identificó la presencia de HCl en el jugo gástrico y propuso la teoría que los pesos atómicos de los elementos eran un múltiplo entero del peso del hidrógeno (hipótesis de Prout).

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Life and career

William Prout was born on 15 January 1785 at Horton, Gloucestershire, the eldest of the three sons of John Prout (1745-1820) and Hannah Limbrick (1756-?), who earned their living as tenant farmers. He learned reading at a dame's

school at Wickwar, a neighboring market town, writing and arithmetic at a charity school in Badminton, and also helped his parents in farming. Since an early age Prout suffered from strong pain in the ear and when he went to bed he used to cry for a long time until he fell asleep (Anonymous, 1851). When he was seventeen he entered the Sherston Academy, a

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private institution managed by the Reverend John Turner, where he learned Latin and Greek. In 1805, aware of the shortcomings of his education, Prout put an ad in one of the local newspapers requesting information about a possible place to complete his education. As a result of this query, at the age of twenty-one, he joined a private academy managed by the Reverend Thomas Jones (1758-1812), and located at Redland, Bristol. He stayed at the academy for about two years, studying the classics and earning his living as a private tutor. In 1808, at Jones's recommendation, Prout enrolled in the Faculty of medicine of the University of Edinburgh. While there he boarded with Jones's friend, Dr. Alexander Adam, rector of high school of Edinburgh, and eventually married his daughter. Prout remained in Edinburgh during his studies and graduated MD on 24 June 1811 with a 27-page dissertation on intermittent fevers (Prout, 1811; Brock, 1965). After graduation Prout moved to London where he completed his practical training at the United Hospitals of St. Thomas's and Guy's in London. On December 1812 he gained the licentiate of the Royal College of Physicians and in May of the following year he was elected member of the Medical Society. In the latter he became a member of Council from 1817 to 1819 and served twice as its Vice-President (in 1823 and from 1833 to 1835) (Brock, 1965).

Simultaneous with his medical practice, Prout gave a successful course of public lectures on animal chemistry in his London home. The course was intended to "give a connected view of all the principal facts belonging to this department of chemistry, and to apply them, as far as the present state of our knowledge will permit, to the explanation of the phenomena of organic actions"; quite a challenge at a time when the subject was in its infancy. The clear success of these lectures ensured Prout's election to the Medical and Chirurgical Society on May 1814 (Anonymous, 1851; Brock, 1965; Rosenfeld, 2003).

On 22 September 1814, Prout married Agnes Adam (1793-1863); a daughter was born in 1815, which only survived a few months. There were six further children: John William (1817-1881), Alexander Adam (1818-1854), Walter Robert (1820-1857), Thomas Jones (1823-1909), and two daughters, Elizabeth (1825-1918) and Agnes (1826-1878).

Prout's later life was marred by deafness that affected him since childhood. This flaw led to his social and professional isolation. His health aggravated in the spring of 1850, apparently from lung problems. Before his death he requested no inspection of his body he made, so the cause was entered as "gangrene of the lungs." He was buried in Kensal Green cemetery and by his request a plain slab was erected to his memory in Horton Church. His wife, four sons, and two daughters survived him (Anonymous, 1851; Brock, 1965).

Prout was elected fellow of the Royal Society (1819) and of the Royal College of Physicians (1829). He was awarded the 1827 Copley medal of the Royal Society and elected Gulstonian lecturer at the Royal College of Physicians (1831). Among his many professional duties were member of the Council of the Royal Society and of several of its committees and on those of the British Association for the Advancement of Science. He was also active in the Medico Chirurgical Society of London.

Prout developed his medical career as an expert in stomachal and urologic diseases, becoming a well-known and popular physician in these areas. He summarized his findings

in his book *An inquiry into the nature and treatment of gravel, calculus and other affections of the urinary organs* (Prout, 1821), republished later as *On the Nature and Treatment of Stomach and Urinary Diseases* (Prout, 1840; Prout, 1848).

His first paper beyond the doctoral dissertation was published in 1812 and dealt on the sensations of taste and smell (Prout, 1812). In 1813 a published a long memoir on the quantity of CO₂ emitted from the lungs during respiration, at different times and under different conditions. The pertinent experiments were made on himself over a 3-week period, under very controlled conditions, and using an instrument of his design (Prout, 1813b; Prout, 1814).

In 1815 and 1816, Prout published two anonymous articles on the "relation between the specific gravities of bodies in their gaseous state and the weights of their atoms", where he suggested the atomic weights of all the elements were whole number multiples of the atomic weight of hydrogen so so this element could be considered the $\rho\omega\tau\eta$ $\nu\lambda\eta$ of the ancients (Prout's hypothesis) (Prout, 1815f; Prout, 1816a). Eventually Jöns Jacob Berzelius (1779-1848) and Jean Servais Stas (1813-1891) proved this theory to be wrong.

In 1815 he analyzed a sample of pulverized excrement of the boa constrictor and found that the portion insoluble in HCl was a bluish material containing 90.16 wt % uric acid, mixed with minute amounts of potassium, ammonia, magnesium, and calcium salts, and animal matter (Prout, 1815b). This was the first time uric acid had been shown to be synthesized by this type of animals. Prout was surprised that nearly the whole food taken by the animal was converted into uric acid, and speculated that the possible reason was a disease arising from the artificial conditions in which the reptile was kept. He mentioned that William Hyde Wollaston (1766-1828) had previously demonstrated that the excrement from birds fed on animal matter also contained uric acid, although in a lesser proportion (Wollaston, 1810).

In 1818 Prout prepared urea in its pure state and described its properties, composition, and the preparation of many derivatives, as well as the analysis of several urinary stones (Prout, 1818a-c; Prout, 1819a). Three years later he published a study of the changes that take place with time in fresh and incubated eggs (Prout, 1822a).

In 1823 he announced to the Royal Society he had found that the walls of the human stomach secrete free HCl and that this acid was the main digestive agent of the organ, and the salts usually met with in it were alkaline chlorides (Prout, 1824). Initially this discovery was hotly contested but was later confirmed by many important scientists, among them Friedrich Tiedemann (1781-1861), Leopold Gmelin (1788-1853), John G. Children (1777-1852), and William Beaumont (1785-1853) (Copeman, 1970).

A completely different research was the measurement of the specific gravity of air and the laws of its expansion. Here he showed his abilities as instrument maker by building a barometer, which probably served as prototype to the one built for the Royal Society in 1835 (Prout, 1832; Copeman, 1970).

In 1834, the paleontologist William Buckland (1784-1856) requested from Prout to analyze the bezoar stones found at the geological sites in Lyme Regis and Westbury on Severn. Prout found all of them to have a very similar composition, basically, calcium phosphate and calcium carbonate, with

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