



Leonard Sadi Carnot

1796 - 1832

The French engineer and physicist, Leonard Sadi Carnot, was born in Paris, in the Palais du Petit-Luxemburg, to the family of Lazare Carnot, a major figure of the French Revolution and the man named as the 'Architecte de la Victoire' of Napoleon's Army. Lazare had a wife, Sophie, and two sons, Sadi and Hippolite. Carnot's family suffered from many changes during this unstable period in the history of France.

Lazare himself was a good mathematician and published work on mathematics and mechanics as well as on military and political matters. **Withdrawing from public life in 1807, Lazare Carnot concentrated on the scientific education of his sons.**

From his father, the young Carnot received a good training in mathematics and mechanics, physics, languages and music. Following a few months' preparation, at the Lycée Charlemagne, he was admitted in 1812 to Polytechnique, an institution providing an exceptionally fine education with the help of famous scientists.

Ranking sixth in his class, Carnot finished his studies at Polytechnique and was sent to the École du Genie at Metz as a second lieutenant student.

By the time Carnot graduated in 1814, Napoleon's empire was being rolled back. During Napoleon's brief return to power in 1815, Lazare Carnot was a minister of the Interior, and his sons became the object of special attention from his superiors. This ended in 1815, when Lazare was exiled after the Restoration and fled to Germany, never to return to France.

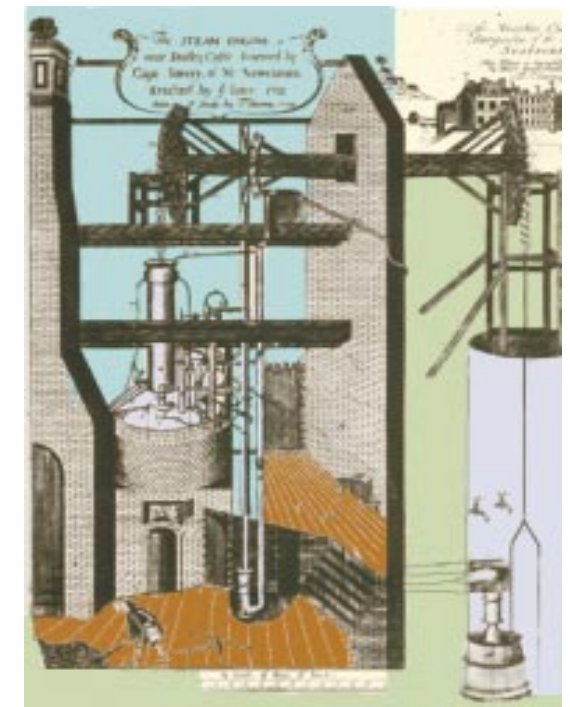
Carnot became an army engineer, at first inspecting and reporting on fortifications. In 1819, after passing a competitive examination, he gained a post in the army general staff corps in Paris. Soon later he retired on half pay, living in Paris and turning to science.



*Carnot's father
served under
Napoleon*



*He studied the
science of the
steam engine*



Sadi Carnot had many interests: industrial development, tax reform, mathematics and fine arts. He was particularly interested in problems related to the steam engine and its efficiency; steam power had already many uses, such as draining water from mines, excavating ports and rivers, forging iron, grinding grain and spinning and weaving clothes. However, it was inefficient.

In 1824, Carnot published his classic work, '*Reflection on the Motive Power of Heat*'. There he analysed the efficiency of engines in converting heat into work. He found that the efficiency of an idealised engine depends only on the temperature difference of its hottest and coldest parts and not on intermediate stages through which the engine passes. He introduced the theorem of reversibility in the form of the ideal '*Carnot cycle*'. Using this idea he derived an early form of the second law of thermodynamics, stating that heat always flows from hot to cold.

Although his result was presented to the Academy of Sciences and given an excellent review in the press, this work had been completely forgotten until 1834, when Emile Clapeyron, the railroad engineer, started to extend Carnot's views.

Carnot is described by his biographers as being a very sensitive and perceptive person, although introverted in his relations even with his close friends.

In 1831 Carnot began to investigate the physical properties of gases and vapours. In June 1832 he contracted scarlet fever. His health was so badly damaged that on 24th of August in 1832 he fell victim to a cholera epidemic and died within the day. According to the custom of the time, all his belongings, including nearly all his papers, were burned.

S.E.