

# A Great Man

**A**viation pioneer, inventor, explorer and astronomer, Lawrence Hargrave was born in Greenwich in the United Kingdom on 29 January 1850. In 1865, at the age of 15, Hargrave joined his father in Sydney. Although he had aspired to a career in the law, after he failed his matriculation examination, Hargrave was apprenticed as an engineer to the Australian Steam Navigation Company. Over the next five years he acquired practical and design skills that were to prove invaluable later on.

In 1878 he was appointed as an assistant astronomical observer at Sydney Observatory, a post which he held until 1883.

Hargrave's father had made a number of shrewd land purchases and provided well for his sons. Consequently, in 1883 Lawrence was able to cease paid employment to devote the remainder of his life to research work.

Observations of waves and the movements of fish, snakes and birds paved the way to Hargrave's keen interest in problems connected with human flight. His first experiments concentrated on the means of propulsion, and his aim was to imitate the flapping of birds' wings. After conducting trials with monoplanes powered by compressed air or rubber bands, Hargrave began to consider the possibility of a machine that could carry the weight of a human body.

**// The first public flight ... utilised a machine consisting of Hargrave box cells //**

In 1889, Hargrave built one of his great inventions, a rotary radial engine. The principle of Hargrave's engine would later be applied for many years in aircraft engine manufacture. He then began the investigations that culminated in his second great invention, the box kite. This was to have substantial impact on the development of the aeroplane.

Research had convinced Hargrave that cellular, or box, kites had better lift and stability than monoplanes. Eventually, on 12 November 1894, Hargrave made his debut flight in a construction of four linked kites attached to the ground by gun tackle. He flew 4.9 metres above the beach at Stanwell Park, NSW.

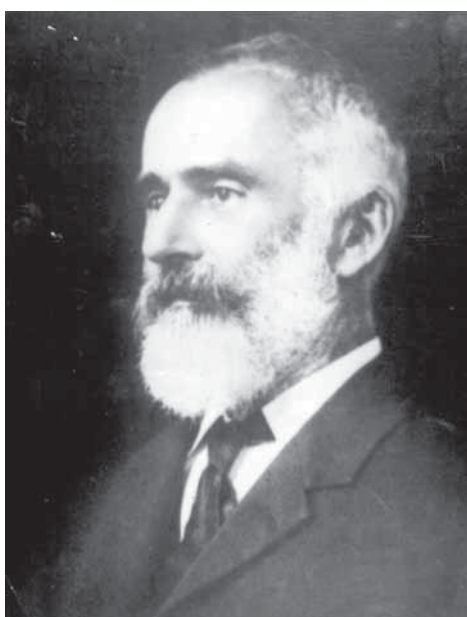
Before long, Hargrave's pioneering aeronautical development – in the form of a box-kite-like wing – was incorporated in the first successful aircraft. The Wright brothers had access to Hargrave's work through the aviation annuals published by James Means, and the American engineer Octave Chanute's, *Progress in Flying Machines*. Chanute, who corresponded with the Wright brothers, devoted a section of his

## **Lawrence Hargrave**

**Aviation Pioneer and Inventor**

Born: 29 January 1850, Greenwich, UK

Died: 14 July 1915



book to Hargrave's experiments. Although the Wright brothers used as the layout for their successful aeroplane Octave Chanute's biplane glider, a derivative of Hargrave's box kite, understandably they admitted no influence.

In 1894, Octave Chanute wrote: 'If there be one man more than another who deserves to succeed in flying, that man is Mister Lawrence Hargrave of Sydney.'

Hargrave's box kite continued to exercise influence at the leading edge of aeronautics. Because of the remarkable stability of the design, it formed the basis of the first generation of European aeroplanes. The first public flight in Europe, by Alberto Santos-Dumont in France in 1906, utilised a machine consisting of Hargrave box cells, and when Gabriel Voisin built the first commercially available aircraft, he called the box-wing cells 'Hargraves'. Among other plaudits, Hargrave received a Bavarian award in recognition of his pioneering aeronautical achievements.

Steadfastly opposed to the use of flying machines for warfare, he returned this award at the outbreak of World War I in 1914.

Hargrave was a passionate advocate of freedom of communication within the scientific community and an equally passionate opponent of the patenting system. Inventions, he believed, should be available for the benefit of all. In keeping with these principles, he published all his theoretical work and the results of his experiments in the *Journal and Proceedings of the Royal Society of New South Wales*.

Lawrence Hargrave continued his experiments with flying machines but was stymied by a shortage of skilled engineers, insufficient money, and the solitary nature of his work. Nevertheless, in 1909 he became a Vice-President of the NSW Section of the Aerial League of Australia, and the following year his models were accepted by the Bavarian government for display at the Deutsches Museum in Munich.

His son and fellow experimenter, Geoffrey Lewis Hargrave, was killed at Gallipoli in May 1915. Shortly after receiving this tragic news, Lawrence Hargrave fell seriously ill and he died in a private hospital in Sydney on 6 July 1915.

During his lifetime, he often felt isolated and unrecognised, but today his significance is apparent and his surviving aeronautical models, drawings and correspondence have been preserved by Sydney's Powerhouse Museum. His name is commemorated in many places; an opera, *Lawrence Hargrave Flying Alone*, has been based on his life; and for many years his face adorned our \$20 banknote – the same one that we used to pay our airport departure tax.

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