

HOW IT BEGAN

The modern hang glider is a belated but much improved modification of some of mankind's early attempts at flying machine construction.

It uses the basic principles of the simple kite, the schoolboy's paper dart, and the original glider, all developed long before the Wright Brothers introduced a motor to produce the aeroplane.

The father of the glider is generally held to be Otto Lilienthal, a German genius who, with his brother Gustav, built and flew the first recognised hang gliders in the 1890's.

Until the first experimental Lilienthal craft took to the air, balloon flight, developed in France by the Montgolfier brothers in the 1780s, had been man's only successful venture into the sky.

Otto Lilienthal was not the first to fly gliders. Englishman Sir George Cayley produced drawings of a glider as far back as 1804, wrote lengthy articles on the theory of flight, and actually built a glider which was said to have carried a boy aloft in 1852-53.

But it was Otto Lilienthal and his brother who gave the world the forerunner of the modern hang glider by devoting many years to polishing and finally perfecting a simple glider flown by a man hanging beneath it.

Otto, born in 1848, and Gustav, a year younger, were both fascinated with the possibilities of flight from their very early years. They began experimenting with model gliders as schoolboys in Pomerania.

The Lilienthals were well-educated, with keenly probing minds. Otto was an engineer, and Gustav a distinguished architect. They are said to have got their ideas of flight from watching storks gliding up from their nests on the wind, without flapping their wings. If the storks could do it, why couldn't they?

Both spent a lot of time flying kites and watching birds as boys and dreaming of one day flying themselves. As adults, the two studied bird flight exhaustively, and in 1889 Otto published a book, "Bird Flight as the Basis of Aviation," putting forward a theory of flight which became the basis for the modern science of aerodynamics.

In 1890 the brothers put their theories to the test by constructing a full size glider. It incorporated the discoveries they'd made by studying birds — the theory of dihedral, wing camber, and the importance of curved wing surfaces.

The first glider was a slightly-dihedralled 23 foot rigid wing, built of willow wands covered with waxed cotton cloth. The pilot hung with his body beneath it and his head protruding through a hole in the centre. The wing weighed 18.16kg, and control was obtained by shifting the weight of the pilot's body, supported on a circular frame, with his hands grasping parallel bars.

It looked like a monstrous butterfly — and it flew. Launched from a hilltop by Otto running down the slope, it made a series of successful controlled flights, with Otto as pilot.

The brothers continued experimenting with gliding machines for years. They added a tail to aid stability, and gave the world the forerunner of the aeroplane. Their experiments were not without mishaps.

Otto crashed once from 18 metres, at a speed of 56 kilometres per hour, suffering a sprained arm and gashed head.

In 1894 the brothers constructed a hill of earth as a launching site at Gross Lichterfelde. They built a biplane with wing area of 59.17 m². It glided up to 400 metres at heights of up to 22 metres. Otto devised a head-controlled elevator, and was planning to

German



Otto Lilienthal

install a 2.5hp motor on a new biplane when disaster struck.

Before he could test his motorised hang glider, and after more than 1000 successful flights, he crashed from 15 metres flying one of his earlier monoplanes. He died the following day, August 10, 1896, of a broken spine. His dying words: "Sacrifices must be made."

It is ironic that Otto was possibly on the verge of discovering powered flight when he crashed and died. Fortunately the Lilienthals were not jealous of their discoveries. They willingly shared their knowledge.

One of Otto's correspondents was Wilbur Wright, the American, who later bought plans of the Lilienthal gliders and had them sent to the U.S.A.

At the time of Otto's death, "cranks" all over the world were fired with the ambition to fly, and were building similar machines.

Englishman Percy Pilcher built several hang gliders similar to the Lilienthal craft. One, nicknamed The Bat, looked something like a

modern Rogallo hang glider, in that it had a sort of king-post supporting the wings with a network of stretched guy wires.

He flew the contraption in 1893 on his first attempt, hovering without forward motion for two to three minutes at a height of 3.6 metres. Later he built more craft of various types. The last, The Hawk, flew up to 230 metres from hilltop to hilltop on a winch line.

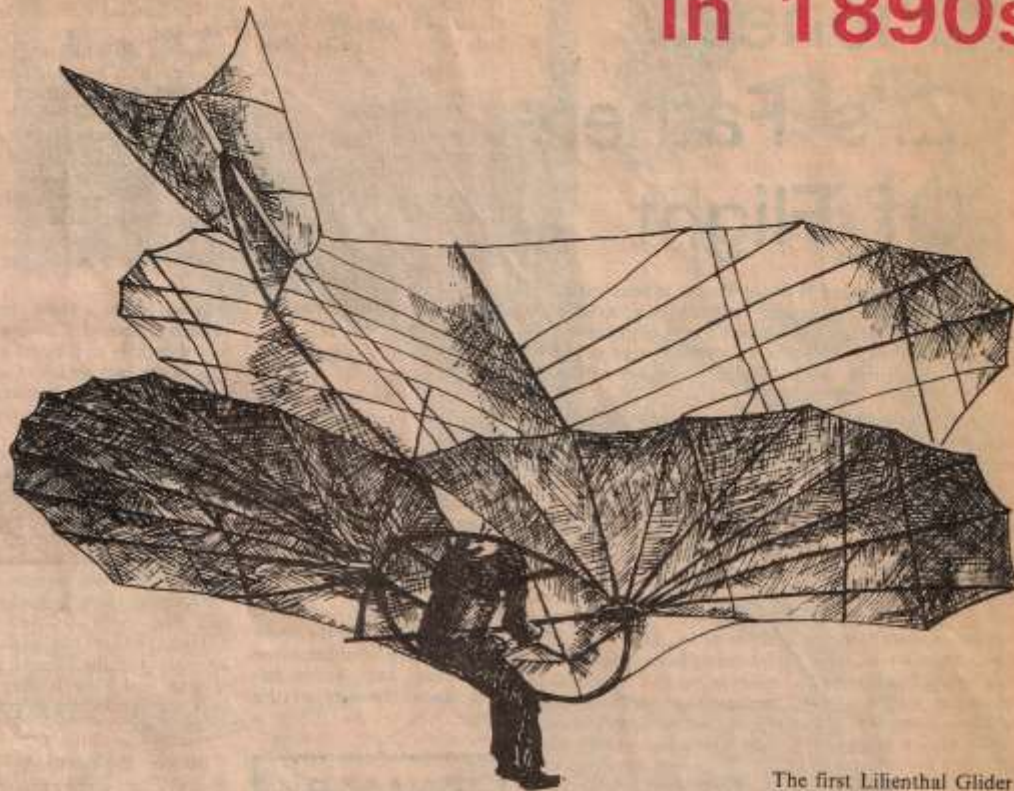
Pilcher was planning to add a motor when he crashed and died on September 30, 1899.

On December 17, 1903, the American brothers Orville and Wilbur Wright put an end to the first hang glider era when they succeeded with powered flight at Kitty Hawk, North Carolina.

After that it was more than half a century before anyone took serious interest in the old type hang gliders. Smitten with the ecstasy of powered flight, man forgot his age old dreams of soaring, like the birds, on the wind's energy.

Propellers, and later jets, and more powerful and noisier power units, replaced the silent flights of the original Old Masters of aviation.

Genius Flew Hang Gliders in 1890s



The first Lilienthal Glider
flown in 1890.

N.Z. family link with the famous Lilienthal brothers

New Zealand has a direct link with the Lilienthal brothers through the descendants of Marie Lilienthal, younger sister of the famous German gliding pioneers.

Marie married and settled in New Zealand in the 1880s.

A great niece of the Lilienthal brothers, Mrs Trudel Risch lives at Oakura, near New Plymouth. Other descendants are still farming at Fairview, near Timaru.

Mrs Risch, head of the Arts Department at Spotswood

College, New Plymouth, was born and brought up in Germany. She has vivid childhood memories of Gustav Lilienthal, her great uncle, and his stories of the early attempts of he and his brother Otto to fly.

The New Zealand link with the Lilienthals was forged when Gustav accepted a contract in 1880 to work as an architect in Melbourne on the Victorian House of Parliament.

His young sister Marie travelled out with him to Australia and developed a

shipboard romance with George Squire, a young English farmer migrating to New Zealand. They married later and settled at Fairview, near Timaru.

Gustav returned to Germany in 1885, and rejoined his brother's flying experiments. Even on the voyage out, he had studied the wing actions of the albatrosses which followed the ship, and was able to add further to the brothers' knowledge of aerodynamics.

Although historians have not recognised Gustav as

prominently as Otto, he played an important role in the background research into the theories of flight, and in the planning of the Lilienthal craft. He published a book, "Biotechniques of Aviation" in 1925.

Some of Marie Lilienthal's descendants still live on the original George Squire land at Fairview.

Marie's eldest son, George Otto Squire, was educated and married in Germany. His daughter, Mrs Trudel Risch, came to New Zealand with her husband in 1953.

HANG GLIDING IN NEW ZEALAND