

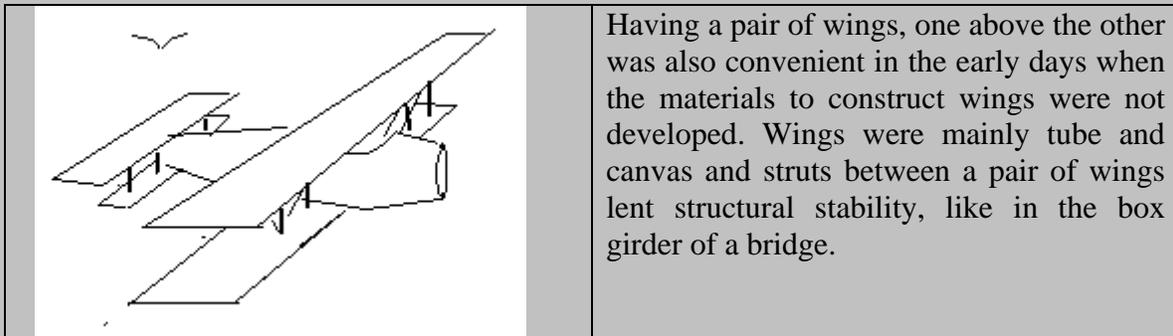
Nature's early flying machine

The biplane design is a simple and stable kind of flying design, says S.Ananthanarayanan.

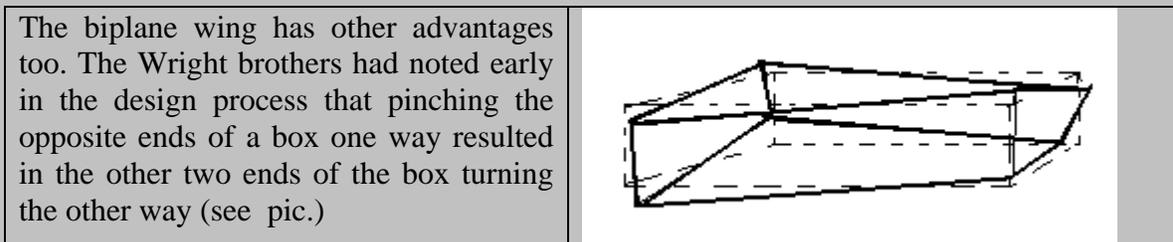
The earliest flying machines, like the one that Biggles flew and other World War I fighters, were of the biplane type. Even the first bombers had these sandwich type of wings.

The early design

The early gliders and powered aircraft designs were based on the box kite, which was known to be stable in rough weather. One of the advantages in this design is that if the kite, or aircraft should tilt, then the lift automatically increases on the wing that has dipped and the aircraft rights itself. This kind of aircraft is then *inherently stable* and closer to the ideal of the flying thing that rights itself to land safely, whatever be the condition in which it finds itself in the air.



It is in the modern aircraft that monoplane wings have become common. This has been possible because of two reasons – materials with greater strength and also computerized controls, to manage the sensitive wing-tip adjustments that single wing aircraft require.



This feature enabled easy control of the orientation of the wings to make the aircraft 'bank' and thus go into a turn, In the early days of flying, it was the biplane design that made possible the complex control necessary for aerobatics. In those days, for a single

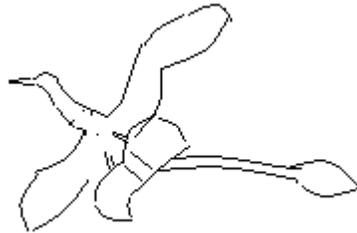
wing aircraft to manage such things would have been both technically out of reach as well as too complex for the pilot.

The basic biplane wing slowly evolved, adding ailerons and flaps, to vary lift and drag and enable larger planes that could do more complex maneuvers. But it was the basic biplane that allowed the industry to literally 'get off the ground'.

It was the same with nature?

Recent archeological finds have suggested that the flight of birds also followed the same path – of starting with the biplane model. Paleontologists in China have discovered remains of the *Microraptor gui*, a chicken-sized animal which lived in the early Cretaceous period some 140 million years ago.

This early dinosaur was a tree dweller that had a pair of wings attached to its upper limbs, to enable simple gliding motion. But it also had a similar growth attached to its rear limbs. And the orientation of the limbs is that this second pair of wings would have been below and not behind the first pair



It is apparent that the first step in evolution of flying creatures should have been towards the simplest flying design. With this basic biplane-type equipment, microraptor gui would have been able to glide from tree-tops to the ground or even from tree to tree. It was in further evolutionary steps that refinements were added, leading to the perfect flight engines, which are modern day birds.
