Getting a buzz from flight

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Getting a buzz from flight

It can hardly have escaped your notice that powered flight is celebrating its hundredth anniversary this year, so this issue has a number of articles on that theme.

The anniversary event is the flight by Wilbur Wright at Kill Devil Hills, Kitty Hawk, North Carolina. On 17 December 1903 he flew the biplane designed and built with his brother, Orville, a distance of 40 m in 12 s.

Just over ten years later, aeroplanes were routinely used in the First World War. Now commercial jets are so common that on a recent flight from Amsterdam I was stuck in a traffic jam in the air, circling London for longer than the time it took to cross the North Sea.

Despite this rapid and life-changing development through the 20th century, flight is remarkably badly understood. Holger Babinsky presents an excellent, lucid account of how a wing really generates lift and blows away quite a few myths. Read it and prepare to cringe mentally at the untruths we have told classes.

Peter Spittle designs jet engines for Rolls-Royce, one of the most important companies in the business. His main interest is the materials that go into a jet, which have to survive incredible stresses and temperatures occasionally in excess of their melting points! Read his article to find out how that works.

My interest in flight involves myth-busting. You all know the one—scientists proved that bumblebees cannot fly. Frankly I got tired of hearing the myth so set out to dig out who said it and why.

It is true that the science of aerodynamics could not explain the flight of insects until very recently. It could prove that dead bees with smooth, rigid wings cannot glide. This is easily proved experimentally too. The pioneering work of people like Torkel Weis-Fogh and, more recently, Charlie Ellington at Cambridge, and Michael Dickinson at Berkeley have revealed all sorts of tricks used by the birds and bees. Not only do they help us understand the world around us, and also finally lay to rest that old myth, but their discoveries are of great interest in the field of MAVs, micro-aeronautical vehicles. MAVs could carry tiny cameras into places a crawling robot cannot, or quickly survey an area, send for help, deliver small payloads or act as a tiny courier.

Ken Zetie

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But who started the myth? The first man in print was August Magnan in his article '*Le Vol des Insects*' in 1932. However, although he did state explicitly that he had analysed the flight of insects and found that 'leur vol est impossible', I am not sure how well known his work was. However, when the great aerodynamicists like Jacob Ackeret can't answer how a bee flies, it gives the population something to cheer about—science may have some answers, but it still doesn't know everything so it can be safely ignored. It's a defence mechanism, an excuse for scientific illiteracy and something we are still battling against today.

But how can flight help the teacher? Even those students who aren't mad about planes (or racing cars) may want to know how a condor glides so effortlessly or how a hummingbird stays in place. The history of flight is also packed with wonderful stories, from George Cayley making his coachman test his glider to Lord Lindemann testing his own theory about controlling a spin (both successfully). Personal successes (and tragedies) abound, from the Wright Brothers to Amelia Earhart. Most recently, Felix Baumgartner glided across the Channel wearing a pair of carbon fibre wings, having been dropped from the height of Everest. As a technology, it touches all our lives. What better way to take physics out of the classroom, or the classroom out of physics?

Ken Zetie