SWEET DREAMS AND FLYING MACHINES

Paul Hoffman, *Wings of Madness: Alberto Santos-Dumont and the invention of flight.* New York: Theia Press, 2003. Pp. 369. US$24.95 HB.

By Juliana Weingaertner

Some episodes in the history of aviation are very well known—for instance, who hasn't heard of the Wright Brothers' historic flight at Kitty Hawk on December 17, 1903? But a different fate was in store for other pioneers of aviation. Among them is Alberto Santos-Dumont, a flight pioneer and inventor who enjoyed a huge reputation at the beginning of the twentieth century, but is little known nowadays outside his home country Brazil. Fortunately, Paul Hoffman makes some progress towards changing this situation in his most recent book: *Wings of Madness: Alberto Santos-Dumont and the invention of flight*.

Hoffman's book is a popular science biography of a rather unusual man. Born in Brazil in 1873 and heir to a coffee fortune, Santos-Dumont grew up fascinated with the modern machinery employed in his family business. An affectionate reader of Jules Vernes, he became interested in ballooning at a very early age, building miniature hot-air balloons at the age of ten. At eighteen he moved with his family to Paris, where he pioneered work on powered balloons. Although there had been a few previous attempts to provide power sources to balloons, nobody was working on controlled aerial navigation at the time Santos-Dumont arrived in France. In the following years he built a dozen dirigibles, and won the prestigious Deutsch Prize in October 1901 for circling the Eiffel Tower. This event helped to show that the airship could be a practical means of transportation—an idea that had little support at a time when the automobile was still a novelty in the streets of Paris. Unfortunately, little technical detail of these airships is provided by the book. Instead, Hoffman focuses on Santos Dumont's life. While there is no doubt that Santos-Dumont's life was interesting, it would be a shame to have his extravagant lifestyle overshadow his contributions to aviation. We are told, for instance, how Santos-Dumont was easily spotted in the skies of Paris using one of his small motorized balloons to go to clubs and restaurants, and how he delighted the Parisian elite by offering "aerial dinner parties", in which tables and chairs were suspended from the ceiling of his apartment so that the guest could imagine what it would be like to be in a flying machine.

Later Santos-Dumont turned his attention to heavier-than-air crafts, and joined the race to build the first aeroplane. In 1906 the Wright Brothers' flights were largely unknown in Europe, partly because the Wright Brothers worked in secrecy and made little effort to publicise their flights. It was Santos-Dumont who was then acclaimed for the world first powered

heavier-than-air flight: in October 1906 with his *14-Bis* aeroplane he won the Archdeacon Prize for the first flight of twenty-five meters; and one month later, he won the Paris Aéro Club Prize for the first flight of a hundred meters.

Not surprisingly, much of Santos-Dumont's subsequent life was devoted to arguing against the Wright Brothers' later recognition for building the first aeroplane. So it is a bit disappointing that Hoffman does not go deeper into this controversy. After all, disputes over priority in the history of science and technology can make compelling reading. And there are at least some doubts whether the Wright Brothers deserve the credit for inventing the aeroplane.

The first problem concerns how one ought to present the results of a scientific discovery. It is well known that the Wright Brothers did not present their inventions to the scientific community until as late 1908. Their previous flights were witnessed primarily by residents of the neighbourhood where they conducted their experiments. Here one might argue that the question of priority could have been obscured by the lack of qualified and impartial witnesses. The point in dispute is not whether the Wright Brothers actually flew in a heavier-than-air device—in fact, man-carrying gliders were around since 1853—but whether their plane was sustained by its own power and did not rely on particular weather conditions or external devices to take off. And this last issue is much more difficult to settle.

In contrast, Santos-Dumont's efforts had approval from an expert community, which had outlined a set of rules to assess a powered flight. For instance, the scientific commission of The Aéro Club de France demanded that the committee be notified twenty-four hours in advance, and required the plane to take off and land by its own means on flat ground.

Another problem with crediting the first flight to the Wright Brothers concerns the reproduction of a scientific experiment. In many domains of science results are expected to be duplicated under similar circumstances. Here the reader might recall the cold-fusion debate, in which failure to reproduce the results of an experiment under rigorous conditions played an important role in the rejection of the relevant theory. In a similar vein, it has been very difficult to reproduce the Wright Brothers' earlier flights—the last famous attempts being made at the "centennial" celebration of flight in December 2003, in which a replica of the Wright Brothers' *Flyer I* could not be made to leave the ground. This suggests that the Wright Brothers depended on some very particular conditions for take off—such as the presence of steady and strong headwinds—casting some doubt on the claim that they realised the first unassisted flight.

There remains the conceptual problem of defining what counts as the first heavier-than-air flight. Most people engaged in the debate seem to believe that there is this thing called *the first flight* and the only problem is to establish who deserves the credit for this. But a closer look at the terms

used in the dispute show that many different descriptions are associated with the first heavier-than-air flight. While some refer to it as the first practical or controlled flight, others prefer to put more weight on whether it was unassisted, public, or sustained by its own power. So Hoffman remarks that "[t]rue, he [Santos-Dumont] had made the world's first public flights, but they certainly were not controlled ones"(p.266). He argues that Santos-Dumont's *14-Bis* was not stable because the aircraft did not have much control of the roll axis. In contrast, the Wright Brothers had dealt with this problem very successfully. On the other hand, if we think that the first flight had to be unassisted, in the sense that it did not rely on external devices or particular weather conditions for take off, Santos-Dumont seems to have the advantage over the Wright Brothers.

Besides the lack of agreement as to what is expected from an aeroplane, there is the problem that many of the terms used to describe the first heavier-than-air flight are vague or relative. For instance, what exactly distinguishes a simple hop from a short flight? How much control does an aircraft have to have to claim that it has achieved a controlled flight? These questions seem very difficult to answer, partly because, by modern standards, all the early aeroplanes were very unstable and because there is no clear boundary between a hop and a short flight.

Even without paying much attention to this debate, and without giving an entirely satisfactory account of Santos-Dumont's contributions to aviation, the book should be welcomed for covering a chapter in the history of technology that is little explored in the English-language literature. Part of the difficulty in writing about Santos-Dumont is that we do not know much at all about his work away from the public domain. So Hoffman's research was impeded to some extent by the lack of bibliographical resources. While this book may not entirely satisfy the professional historian, it does open the door for further work on this fascinating character and interesting episode in the history of aviation.

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