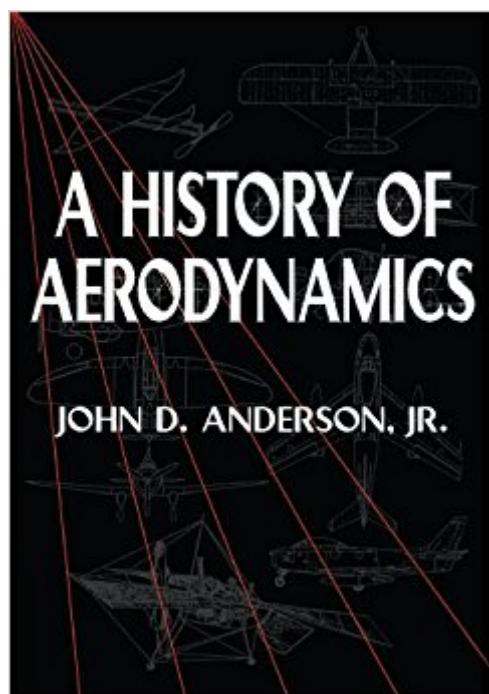


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# A History Of Aerodynamics: And Its Impact On Flying Machines (Cambridge Aerospace Series)



## Synopsis

Aerodynamic principles that make flight possible were little known or barely understood as recently as one hundred years ago. Although their roots can be found in the fluid dynamics of ancient Greek science, it was not until the scientific breakthroughs at the beginning of the twentieth century that it became possible to design successful flying machines. This book presents the history of aerodynamics, intertwined with a review of the aircraft that were developed as technology advanced. Beginning with the scientific theories and experiments of Aristotle and Archimedes, the book continues through the applied and theoretical aerodynamics in the early 1900s, and concludes with modern hypersonic and computational aerodynamics. Students, fluid dynamicists, aeronautical engineers, and historians of technology will find this book a thoroughly engrossing account of the role of aerodynamics in the development of science and technology in this century.

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## Customer Reviews

"...a very important contribution to the history of aeronautics, well written and technically competent." Choice"..."a well documented, tastefully compiled, and chronicled historical development of the field of aerodynamics...This reviewer recommends this good book to all individuals involved with hydrodynamics, aerodynamics, airplanes, turbo machinery applied mechanics, and the history of science as well as to all technical university libraries." Applied Mechanics Reviews"..."written with a handsome style and supplemented with a large number of illustrations...this well-documented,

highly readable book does indeed contribute to enlighten the background of the science of aerodynamics and, as such, is recommended to all students, engineers and researchers working in the field of aeronautics." European Journal of Mechanics" The textual balance achieved by the author has resulted in a book that is enjoyable and educational... This book on the history of aerodynamics adds a much needed dimension to an historian's interest in aircraft and aviation. To appreciate the development of today's aircraft, it is important that we understand the past." American Aviation Historical Newsletter" The book contains a rich bibliography and may be useful for students, including postgraduate students, and specialists in the field of aerodynamics and fluid dynamics." Mathematical Reviews" ...this is an excellent book that deserves a very wide readership." The Times Higher" This book is a notable contribution to the history of technology and is recommended reading for all practising aerodynamicists and aeronautical students." The Aeronautical Journal" anyone with a sincere and deep interest in the evolution of the aeroplane ought to read it." Aeroplane

Aerodynamic principles that make flight possible were little known or barely understood as recently as one hundred years ago. It was not until the scientific breakthroughs at the beginning of the twentieth century that it became possible to design successful flying machines. This book presents the history of aerodynamics, intertwined with a review of the aircraft that were developed as technology advanced. Beginning with Aristotle's scientific theories and experiments, the book continues through the aerodynamics in the early 1900s, and concludes with modern hypersonic and computational aerodynamics.

A great book that puts the development of the aircraft and modern fluid dynamics into perspective. I admit my own knowledge of the history of the topic, which is my favorite topic by the way, was somewhat sporadic. Not any more. The book has limited mathematics, just enough to clarify and provide deeper insight into the topic. Therefore, it is suitable for readers who are averse to math but want to know more about the history of aerodynamics. If you care at all about aerodynamics or if you're a history-of-science aficionado, then this book is for you. I will be strongly recommending it to my students of aerospace engineering this fall. My only complaint is that the reproduction quality of some of the photographs could be better. However, other illustrations are generally clear.

Everything I needed to know about this fascinating field. Super well organized and written. Bravo John Anderson, Jr.

A very comprehensive and clear presentation. After having studied aerodynamic theory for a while, it was very helpful to read this book to gain a better understanding of the historical context of these theories and how they compare with measurements.

Simply the best book on the subject. Period.

Prof. Anderson's book "Aircraft Performance and Design" is one of the few textbooks that I have been able to read cover to cover with a complete understanding of the material presented. I attribute this to the author's clarity of thought and his ability to present his thoughts through extremely clear writing. "A History of Aerodynamics" is written with this same style. Aircraft design depends on five basic aspects: aerodynamics, propulsion, structures, flight dynamics and control, and electronics (avionics). Obviously each of these five aspects is related to all the others, and a successful balance results in a successful aircraft. This book focuses on the history of the first: aerodynamics. Contributions from men like Prandtl, Kutta, Joukowski, and von Karman to theoretical aerodynamics, and men like Cayley, Eiffel, the Wright Brothers and researchers at NACA to experimental aerodynamics are covered in the book. This book, and other books on the history of science, provide an appreciation of the tremendous amount of effort necessary from the strongest intellects in history to understand and distill into useable mathematical relationships the most basic of physical phenomena. Other reviewers have presented detailed reviews of the contents of this book. I'll just add that if you have an interest in aerodynamics, this book provides an excellent in depth overview from the very beginnings to the present day. Don't worry, no matter what your level of understanding of physics or engineering, you won't get bogged down, and neither will you be bored. This is one of my favorite books, and it's on my re-read list.

This book is almost sure to be the definitive treatment of this subject for many decades to come. As far as I know, it is the most comprehensive history of aerodynamics and its relationship to aircraft development. Speaking as someone who has been involved technically in aircraft design, I found it truly fascinating to learn how today's techniques and base of knowledge evolved through the interaction of theory, experiment, and engineering experience. I believe that this book will interest anyone who wants to understand how aircraft design has evolved and why airplanes were designed as they were at various times and places. It is, as the title says, strictly about aerodynamics and does not cover many other matters of vital importance to aircraft design, such as structure, mass

properties (like the inertial moments mentioned by another reviewer), propulsion, or systems. Moreover, it's about the principles of aerodynamics and does not cover many of the important aspects of its application to aircraft, such as propulsion system integration. Thus it is not by any means a comprehensive history of aircraft design and development. But it treats its one topic of the development of the principles of aerodynamics for aircraft very well. The book does not assume any real technical knowledge of aerodynamics, although I imagine it could be somewhat tough going for someone who had no prior knowledge of the subject at all. There is a sprinkling of equations and a few mathematical arguments, but no one should be put off by them because (1) they are not complex (no calculus) and (2) you can skip over them if you are willing to take the author's word on what they mean. From my perspective, the author does a good job of explaining concepts clearly and correctly. He does not insult the expert's intelligence, while remaining accessible to those without deep knowledge. More technical details are given in appendices. Of course it is impossible in any single book to cover all important developments in aircraft aerodynamics. This book is definitely slanted toward the fundamentals -- the Wright brothers don't appear until nearly halfway through the book. The author, himself an authority on modern aerodynamics, only very briefly sketches developments of the past 50 years, on the grounds that they are too much a story in progress to make for concise history. For readers used to thinking of the US as the world leader in airplane development and manufacture, it may come as a surprise to learn how often America trailed behind in the development of aerodynamics and how fortunate Americans were to have escaped the worst consequences of their nation's past (and recent) neglect of research in this vital area. In light of the book's emphasis on this, it was a little surprising to find another reviewer criticizing it as too slanted toward US developments. In leafing through the index I see a strong preponderance of names from outside the US. In order to keep the book to "only" 450 pages of text, however, the author does often concentrate on the main theme in a given area and does not cite all of the parallel and supporting work elsewhere, leading to neglect of some non-US (and some US) efforts. I particularly liked the way the book puts a human face on the story by giving brief biographical summaries of the people who have played key roles in aerodynamics development and sketching the times and circumstances in which they worked. Readers hoping for a brief (and somewhat impressionistic) introduction rather than Anderson's more comprehensive approach may want to look up Theodore von Kármán's *Aerodynamics* (1954) or John E. Allen's *Aerodynamics: A space age survey* (1966). The standard broad surveys of the development of aircraft design and technology are Ronald Miller & David Sawers, *The Technical Development of Modern Aviation* (1970) and Laurence K. Loftin, Jr., *Quest for Performance: The Evolution of Modern Aircraft* (1985; NASA

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