

## Wings of Fire

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*Wings of Fire*

A P J Abdul Kalam

Universities Press, Hyderabad, 1999

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The book *Wings of Fire*, the autobiography of A P J Abdul Kalam constitutes an extraordinary reading for the young and old, for a common man and a professional including management pundits, and for the uninitiated and the technically trained alike. There is something that everybody can extract from this book. Only the very young readers of *Resonance* may find it beyond them.

The writing style is very gripping, and the contents are very unusual in their frankness at several levels while not being caustic or cynical and provide a brief panoramic view of the space and missile technology arena of the country. Books of this kind are very rare in our country; and we are prone to idolize and eulogize scientists and other personalities with individual excellence with almost no appreciation for the milieu in which creativity is possible. We are also hesitant to record truth, if we take interest in recording at all. The book is the story of a man who did not quite acquire 'power' by climbing through academic corridors, an approach with all its penchant for placing or replacing idols in its own sanctum-sanctorum of the academies or other positions is practised assiduously in the

country. Even in the absence of this power (or, is it because of its absence), he wove together large number of groups, challenged them to do the 'impossible', promoted them to work towards a common goal, and through successes, raised their self esteem enormously.

Apart from the very indicative title, the chapters of the book are also touching – orientation, creation, propitiation, and contemplation. Orientation contains 32 years of his early life – days as a child, going through adolescence and getting into rocketry. His description of the people who shaped his life, interweaving religion and education, is a charming part of the book that almost nobody would miss reading. One is reminded of R K Narayan while flipping through the text. The difficulties involved in getting education are very reminiscent of the era – the late thirties through the forties – which is full of examples of people of lower middle class (to which most of the society belonged) living largely in villages struggling hard to get education in cities/large towns with little infrastructure and financial support. Many in the current era of significant urbanization may not even be able to visualize the trauma that the generation of those times went through. The first chapter captures it succinctly.

Chapter 2 entitled 'Creation' describing the next seventeen years till 1980 covers his struggle at ISRO going from one-engineer-amongst-many to the successful project director of SLV bringing pride to the nation through the technological achievement of

putting a satellite in the orbit. He forgets not recording the contributions of the many – both high profile as well the brave backroom ‘boys’. There are several technological aspects discussed here and these would interest the technically minded a great deal. The description of Sarabhai, the early leader for space technology, his vision, mode of working is historically important. Kalam’s choice as the Project Director by Dhawan as Chairman, ISRO and Brahm Prakash as Director, VSSC has been left unexplained, but perhaps may not require one; they saw in him qualities of bringing together others and getting things done with least interpersonal pain while all the time thinking of possible problem areas requiring attention. His agony when the first SLV flight failed to reach the orbit and the maturity of the management in retaining him in the same position are brought out. There are several attractive observations, poems and personal details of his family interspersed between the hard technical descriptions that keep the reader glued to the book. This chapter ends in the description of his transition from ISRO to DRDO as the next director of DRDL.

The next ten years are set out in chapter 3. These constitute the outstanding accomplishments at DRDL. The way he transformed the laboratory from one which had a weak heart with little confidence to one which felt a sense of strong self-esteem and could feel proud by contributing developed missile systems to the services, is a remarkable saga. The methods by which he accomplished this

were three. First, generate first rate technologically contemporary projects and hold them as challenges to the technical community. Second, bring together academics and scientists from R & D institutions for reviews, a somewhat scandalizing event in tradition bound defence laboratories. Third, hold a fair number of internal meetings with members drawn from different projects and disciplines so that latent difficult issues come up for discussion and learning from one another was caused. The methodology that he adopted here was drawn from his earlier experience in ISRO.

On page 122 in this chapter, he discusses the logic for the choice of the Project Directors for the five integrated guided missile development projects (all of these were his masterly creation). The three paragraphs provide an insightful reading even for a management man, coming as it were from a successful leader. His remarks on T N Seshan (the well-known retired Chief Election Commissioner) are so apt that nobody would disagree. The fact that the book carries several truthful asides like this on personalities known to many including the present reviewer makes it authentic and worthy of reading.

Kalam has pet themes – one of these is the fact that unless we become strong there is no likelihood of us being respected as a super power (in today’s terminology, a country which holds the ability to destroy some other country from a distance). He has used the phrase “strength respects strength” several

times in his lectures. This assessment is indeed correct. The second theme is that India should become a developed nation. In fact, the last sentence of the book is along these lines. The plan to make India an economically strong nation is vital for India to be rated well along with the super powers. For this to happen, many other aspects – the enormous moral decadence leading to corruption in higher levels of society, the inability to prevent this from affecting the common man's life, the inability to improve the quality of life of 70% of the population residing in the villages, the inability to reduce the pace of urbanization and the inability to reduce the inequity between the rich and the

poor need to be accounted for. These are of course beyond the preview of one worthy citizen whose life is described in this book.

The last chapter entitled 'Contemplation' contains a condensation of ideas and thoughts arising out of his colourful life, the awards that he received (the highest honour, namely Bharata Ratna that he received does not find a mention in this book) and some messages for the future generation.

The book is worthy of being read by every Indian who can read!

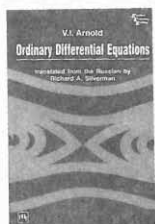
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## Ordinary Differential Equations

*Shiva Shankar*



*Ordinary Differential Equations*

V I Arnold

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"Space and time are commonly regarded as the forms of existence of the real world, matter as its substance. A definite portion of matter occupies a definite part of space at a definite moment of time. It is in the composite idea of motion that these three fundamental conceptions enter into intimate relationship". So declared Hermann Weyl, and this

declaration of the supreme importance of the study of motion is at the same time also a declaration of the supreme position that the theory of differential equations holds in mathematics and physics. For, since Newton, it has been clear that the "shape of motion" is determined by local data, encapsulated in what we call a differential equation, and the study of motion is thus synonymous with the study of differential equations. But the shape of motion equally clearly depends on the global shape of (phase) space, and the study of differential equations must therefore be geometric in its methods. This geometric nature of the study of motion was of course clear to Newton (as even a superficial browsing of the *Principia* will confirm), but had to be reaffirmed by Poincaré after a 200 year interregnum, perhaps inevitable, during

Tui T. Sutherland is the author of the #1 New York Times and USA Today bestselling Wings of Fire series, the Menagerie trilogy, and the Pet Trouble series, as well as a contributing author to the bestselling Spirit Animals and Seekers series (as part of the Erin Hunter team). In 2009, she was a two-day champion on Jeopardy! Wings of Fire Comic. Follow. Add to Favorites.Â The New York Times bestselling Wings of Fire series soars to new heights in this first-ever graphic novel adaptation! Wings of Fire Chapter (Issue) List. Wings of Fire #TPB\_2\_(Part\_2) 03/27/20. Wings of Fire #TPB\_2\_(Part\_3) 03/27/20. Wings of Fire #TPB\_1\_(Part\_1) 03/27/20. Wings of Fire #TPB\_1\_(Part\_2) 03/27/20. Wings of Fire #TPB\_2\_(Part\_1) 03/27/20. Following Comics. You need login to follow comics.