

**Wings of Fire: An Autobiography.**  
A. P. J. Abdul Kalam with Arun Tiwari.  
Universities Press (India) Limited, 3-5-819 Hyderguda, Hyderabad 500 029, India. 1999. xvi + 160 pp. Price: Rs 200.

'The unexamined life is not worth living', said Socrates more than two millennia ago. Here, we have in print, a well-examined life of one of the icons of the post-colonial technological renaissance of the country.

All civilizations are technological, originating from basic discoveries and determined applications of fire, agriculture, the wheel, irrigation, knowledge of materials and metals, etc. A defining feature of post-renaissance technological development was the organized marriage of science and technology, each feeding on the other in a synergistic way. This is where the non-Western nations, India being a typical example, got rapidly left behind. Kalam very vividly recalls a piece of sculpture he saw at the NASA Langley Research Centre where his initiation into Rocket Engineering began – 'a charioteer driving two horses, one representing scientific research and the other technological development, metaphorically encapsulating the interconnection between research and development.' Elsewhere, he writes with great insight – 'Gradually, I became aware of the difference between science and technology, between research and development. Science is inherently open-ended and explanatory. Development is a closed loop... Science is a passion – a never-ending voyage into promises and possibilities.'

Since independence, India has sought in various ways, to harness scientific technology to secure for its people, a life free of want, but free from fear, as well. A. P. J. Abdul Kalam represents the quintessential best of this difficult journey, through personal and professional struggle, to self-realization, and fortunately, also to adulation and success.

This autobiographical account has been one of the most inspiring I have read in recent years. His life has been most selflessly devoted to his country, and rewarded most deservedly, with the highest civilian award of the country,

the Bharat Ratna. The book also goes beyond biography, and serves as an excellent practical guide to R & D management, on how to design and build institutions, mentor and inspire men, to success and fulfilment. The account often goes deep into his own personal philosophy, austere beyond the reach of most average householders, and fortunately for posterity, records his philosophical and spiritual insights in a most accessible way, in spite of his own modest disclaimer, 'I am not a philosopher.' This man, who spent all his life 'learning rocketry', also learnt many valuable lessons on how to manage men, matters and materials, while building up the country's defence R & D Programmes, as also its technological capabilities in Space and Atomic Energy.

Kalam chooses to organize the autobiographical material into four sections: Orientation, Creation, Propitiation and Contemplation, devoted roughly to the first 32 years (1931–1963), the next 17 years (1963–1980), another 10 years (1961–1991), and beyond.

Born to an obscure middle-class family in a remote but spiritually supercharged island town at the southern tip of the Indian peninsula, Kalam progressed in sure and steady steps through childhood, among loving family members who sacrificed readily for him, through scholarship with devoted and inspirational teachers (Rameswaram Elementary School; Schwartz High School, Ramanathapuram; St. Joseph's College, Trichi; Madras Institute of Technology, Madras), into his first foray into professional life. This first phase of his life covers 32 eventful years most felicitously in the space of 31 pages. My nephew, an aspiring engineer himself, just on the threshold of his career after graduation, found this the best part of the book. I was particularly intrigued by the following paragraph on p. 18, which I thought the most meaningful lesson for a young person preparing for a professional life:

'The trouble with Indians (was) not that they lacked educational opportunities or industrial infrastructure – the trouble was in their failure to discriminate between disciplines and to rationalize their choices.'

a lesson that young Kalam learned from Sponder, an Australian aeronautical

engineer who taught him at the Madras Institute of Technology. It was Sponder who, as it were, dedicated Kalam to a life in Aeronautical Engineering. Kalam's own well meaning advice to all novice engineering students is 'that when they choose their specialization, the essential point to consider is whether the choice articulates their inner feelings and aspirations.' All those young men and women who rush headlong into software careers should pause and reflect.

Nearly half of the book goes to the 'Creation' phase. Here, one sees Kalam managing and inspiring large scale developmental projects on rocket technology. This was an adventure, not without struggle and frequent failure, but culminating in the pioneering success of the Satellite Launch Vehicle (SLV-3), the fifth country to achieve satellite launching capability, and thus propelling India into the Space Age. He is seen as engineer and innovator, inspirer and mentor of courageous colleagues, and builder of teams and institutions. This also brought Kalam his first brush with fame, adulation and inevitably, professional rivalries due to jealousy.

The 'Propitiation' phase lets us see Kalam going into the defence stage of his career, breathing fresh life into struggling research institutions under the Defence R & D Organization, and later taking charge of all the DRDO establishments, helping India to acquire modern weaponry and delivery systems. If the 'creation' phase was marked by the SLV-3 saga, this phase had the Agni and related missile programmes as the defining theme.

As Kalam moved into the contemplative phase of his life, a grateful and worshipful nation heaped its highest awards on him, and ironically, also made him take more wide-ranging responsibilities connected with Science, Technology and the Defence of the realm. He gives credit to the many great visionaries who prepared him for life, especially Professors Sarabhai, Dhawan and Brahm Prakash. He ends the book with the fervent prayer that eventually the country will become strong, prosperous and 'developed'.

If for Arun Tiwari, 'writing this book has been like a pilgrimage,' then for me, reading it has been an equally stimulating and uplifting journey through a

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mind riding high on the wings of science and soulful spiritualism. Kalam's exhortation to all of us is that we should give wings to the divine fire we are all born with and have within us, and this will 'fill the world with the glow of its Goodness.'

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**Directory of Electronic Journals, Newsletters and Academic Discussion Lists**, 7th edition, compiled by Dru Mogge and the ARL Directory Staff and Diane K. Kovacs and the Directory Team. ed. Dru Mogge. Association of Research Libraries, Office of Scholarly Communication, Washington, DC, USA. 1997. ISSN: 1057-1337. Price: \$95 (print and electronic), \$70 (electronic only). p. 950.

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It was in the mid-sixties that I left my home and a national laboratory in a small town in Southern India to be baptized as a technical editor by the doyen of Indian technical editors the late A. Krishnamurti at the Publications and Information Directorate of CSIR in New Delhi. One of the first things Krishnamurti asked me to do was to check if journal titles given in references listed in research papers conformed to the abbreviations listed in the *World List of Periodicals*, a three-volume reference source published by Butterworth. Our copy of *The World List* – notwithstanding the sturdy paper and the excellent case binding – was struggling to remain in shape as its pages were constantly being thumbed through. Krishnamurti would not let pass a single non-standard abbreviation! The *World List* listed titles and other useful bibliographic information on printed journals and other serials. That was all there was those days. Those were also the days when I was bitten by the citation analysis bug and I and my associates used to spend countless hours in the libraries of the Indian National Scientific Documentation Centre and the Indian Agricultural Research Institute noting down data from the printed edition of *Science Citation Index*.

With the advent of electronic communication technology, things have changed. Now I use the CD-ROM edition of *SCI* for my research and download valuable data from web sites around the world. But, I just cannot help continuing to use printed journals, although according to this Directory there are at least 2459 electronic journals, 1049 of which are peer reviewed. I do browse *British Medical Journal* on the Web the day it is mounted on the Highwire server at Stanford University and I also get the embargoed news reports from *Nature* a day or two in advance of the issue being made available on the Web. But for accessing most other journals I continue to depend on good old print in libraries of the Indian Institute of Technology and Institute of Mathematical Sciences. A classic case of wasted opportunities: We know that many important journals and databases are available on the Web; we know that speedy access to these journals and databases can enhance India's research productivity; we know that the technology is affordable; and yet we have not done much to translate the access from the realm of the possible to reality.

If you visit ISI's web site you will know that it is now possible for someone using the *Web of Science* to quickly see on screen the full text of any article in hundreds of journals published by ISI's partner publishers in this venture such as Highwire Press, Academic Press, Wiley, American Institute of Physics and so on. Elsevier has made available hundreds of journals on the Web. Of course one has to pay a hefty sum as subscription.

Librarians around the world have been subscribing to scholarly journals for a few centuries, but find it difficult to reconcile to the demands made by the advent of the electronic journals. First of all, there is nothing that they could collect, display, bind at the end of the year, and put on rows and rows of shelves to facilitate archival searching! They are uncomfortable with licensing (as against paying a fixed sum as annual subscription to the printed journal). There are Internet lists such as Liblicense where librarians and publishers discuss what are acceptable practices in the electronic era. Surely the transition is not going to be smooth, but sooner or later much of both primary journals and

secondary services will be transmitted mostly electronically. For a while though both print and Web will coexist. Gutenberg is likely to lose to the Internet.

This two-in-one Directory – already dated! – lists all the known e-journals and newsletters as well as scholarly and professional discussion lists/e-conferences. Each e-journal entry gives a brief description of the journal, the web address, frequency, publisher, date of first issue, and contact address. ISSN and cost information are given wherever available. Entries of academic and professional discussion lists give a brief description of the list, and information on subscription, submission, archives and contact address. As in the previous editions, ARL has included a special article. This year's article on full text journal subscriptions written by Judy Luther is informative and gives a clear idea of what is happening. A crisp Foreword and a brief note on how to use the volume complete the Directory. There are several indexes: Thesaurus Index, Subject Index, and the Main Index.

If you buy the printed volume of the Directory, you and your colleagues can have access to the electronic form (on the Web) without any additional payment.

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**Flood Studies in India**. ed. Vishwas S. Kale. Memoir No. 41. Geological Society of India, P. B. No. 1922, Gavipuram P. O., Bangalore 560 019. 1998. 256 pp. Rs 500/-.

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Floods are considered by laymen as mainly resulting from the incapacity of the river to carry the increased volume of water in its course, and hence resulting in overland flow and causing inundation of neighbouring lands. A meteorologist considers it as resulting from abnormal increases in the quantum