



Wings of Fire –

An Autobiography

*“Woods are lovely dark and deep
But I have promises to keep
And miles to go before I sleep...”*

By Dr. A P J Abdul Kalam
with
Arun Tiwari

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“Wings of fire” is the journey of a small town lad to the great pioneer ship in rocket science, beautifully blended with Indian “space odyssey” and the struggle of a developing nation to become self-reliant in creating its own defense shield defying the domination of developed countries. Fire represents the burning desire of an individual and the book is an account of unfathomable attainment when the “fire within” gets “wings of determination”. Each page of the book is power-packed - power to ignite your mind, power to fill you with optimism and power to make you feel proud of your motherland.

The book is beautifully divided into four sections and meaningfully named as Orientation, Creation, Propitiation and Contemplation each encapsulating a significant time period of Kalam's life.

In Orientation (1931-1963) the author duo take the readers to a small town called Rameswaram of pre-independent India - calm, quite & gently woven by multithreads of religious harmony, the town played a key role in imbibing the same serenity in child Kalam. He inherited kindness from his mother and deep spirituality from his father. Growing in this back drop of sacred surroundings Kalam got a solid foundation of religious faith which came as a savior many a times later in tougher moments of his life.

Kalam a person of high intellect, in all his humility has paid tribute to all his teachers who acted as catalyst in moulding naïve teenager Kalam to a hardworking, determined and focused youth. Sivasubramania Iyer, Iyadurai Solomon, Rev. Father TN Sequeria, Prof. Chinna Dura, Prof. Krishnamurthy, Prof. Sponder, Prof. KAV Pandaliai and Prof. Nara Singha Rao are specially remembered as

teachers with capacity to feed their students intellectual hunger by sheer brilliance and untiring zeal. It is engrossing to read how their teachings carved a scientist, an author, an academician and finally the most loved president of a great nation out of young Kalam.

The book will be a sheer delight for all the academicians who are also the mentors for their students.

From this platform Kalam has addressed the youth to take into stride despair and success alike so that life flows freely like a river irrespective of achievements or failures.

Sharing his own instance of first disappointment when he was rejected by Air force just by one rank, he says that rather than drowning in gloom he waited for the destiny to reveal something more meaningful as advised by Swami Shivanand and how his patience paid off.

Soon he was selected as senior scientific officer at DTD&P where he was put to evaluate Gnat MK I aircraft, study human centrifuge, design and develop the cockpit etc before being posted to Aeronautical Development Establishment (ADE) at Bangalore with an assignment of designing hover craft - his dream job.

“I would enter the assembly shop leaving my other problems outside, just as my father used to enter the mosque for prayer, leaving his shoes outside” speaks volumes about the dedication, determination and focus of Kalam as a Scientist. The hover craft christened 'Nandi' being developed by Kalam and his team got shelved later. The team who worked day and night on the project was disappointed. For the first time Kalam realized “one must fore

see the boundaries of his flight and be ready to handle dejections when the limitations paralyze you.” and he advises the same for the youths of India.

Kalam spirituality touched all aspects of his life including his tennur at ISRO. As described India's first equatorial Rocket Launching station was constructed at Thumba – on a land owned by a church. The prayer room of the church became Kalam's first laboratory, where Kalam could feel the power of prayer and intricate blending of spirituality and science.

Kalam later left for six months training at NASA (USA). With this voyage of Kalam, India also took a significant step in its space expedition. The struggle was yet to follow.

“Orientation” in all its simplicity of narration is capable of motivating young Indian children who are raring to touch the sky.

Creation, the second section of the book covers years 1963 to 1980 – A period of Kalam's association with ISRO.

From this section the technicality of the book increases, although authors have tried their best to explain everything in simplest possible manner. It introduces Dr. Vikram Sarabhai – a person responsible for weaving Indian dream of space research. He is fondly remembered as a mentor who could see strengths and weaknesses of his teammates, delegate responsibilities accordingly and fill the team with utmost optimism and faith even when situations were not so favourable.

The conception of Satellite Launch Vehicle (SLV), Rocket Assisted Take Off System (RATO), Rohini Sounding Rocket (SRS) and decision to go indigenous in making rockets, satellite, SLVs are described in this section.

Formation of Missile Panel Indian Rocket Society, reconstitution of INCOSPAR as an advisory body under Indian National Science Academy (INSA) and Indian Space Research Organization (ISRO) are milestones discussed. While working on stage IV of SLV, Kalam found it difficult to manage his time well. In these self-critical moments Kalam applied principle of management to his team. At each point he closely observed his colleagues and listened to everyone with hand written note prepared which were discussed in weakly meetings. This soon became a successful management mantra of the organization.

It also explains how scarce human resource should be managed through a practical example of the case when in response to the requisition of 275 engineers & scientists only 50 were provided for SLV's development and still the project reached its final stage.

The pursuits of science is a combination of great elation and great despair. The author shares with his readers the painful moments when in spite of years of hard work SLV-3 failed after 317 second of its launch and splashed into sea. With ample criticism & mockery by the media and shattered dreams Kalam & his team withdrew within themselves. However, Dr. Brah Prakash, Director not only provided solace but also a

way to overcome from this despair-just like a team leader should do.

The team ultimately geared up to toil again and finally SLV-3 lifted from SHAR settings Rohini into motion in a low earth orbit and placing India proudly on the world map.

The section also shares moments of elation of Kalam when he was asked to address parliamentary panel by Prime Minister Mrs. Gandhi or when he was awarded Padma Bhushan.

Kalam's transition from space research to Integrated Guided Missile Development program is described lucidly in section Propitiation. Appointment of Dr. Kalam as Director, DRDL and efforts of his teammate further led to successful development of missile Prithvi, Nag, Aakash and Agni.

It will be quite encouraging for Indian youths to know some astonishing facts –Prithvi involved Jadavpur engineering graduates to write robust guidance algorithm, Indian Institute of Science Bangalore contributed to air defense Software for Akash, Re-Entry vehicle was design by IIT Madras and signal processing algorithm for Nag by Osmania University Research unit.

Inducting and involving young blood in nation building was an achievement for a great pioneer that Kalam is. The most appealing aspect of the book is that it has not only autobiographed Dr. Kalam but authors have taken special care to give due credit and sketch the positive side of all the colleagues of Dr. Kalam who helped in building the national pride.

Finally, “Contemplation” gently unfolds the happiness, impetus and pride that a poor nation oppressed for more than 250 years got and the glory it had risen to indigenously with the successful launch of missiles & its space program. The shocked world rose quietly in standing ovation although not without friction. Few lines written by Kalam after successful launch of Agni must be quoted

Do not look at Agni
as an entity directed upward
to deter the ominous
or exhibit your might
It is fire
in the heart of an Indian
Do not even give it
the form of a missile
as it clings to the
burning pride of this nation
and thus is bright

The book has depicted eloquently a simple man Avul Pakir Jainulabdeen Abdul Kalam - 31 letter constituting 5 words to symbolize epitome of knowledge, leadership, humanity, patriotism and spirituality. The book is sure to find place in the heart of millions of proud Indians and leave impact globally.