

The Journey for Becoming A Missile Man

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Abstract

India have given birth great scientists time to time. In the list of Indian scientists Dr. APJ Abdul Kalam has an important place. Kalam was the father of Indian missile technology and known as “Missile Man of India”. He worked on many projects like the satellite vehicle launcher SLV-3 and IGMPD. Dr. A P J Abdul Kalam is sparkling in the sky of science and technology and is a role model of Indian Youths. He done work in the development of aerospace research and he also worked on civil and defense research development. His inventions gave an identity to India in the world. Our neighbor countries are also threatening to see the progress of defense research. The present paper has tried to focus on the incident of his life and people who came in his life which are responsible for becoming him a missile man. And also describe about those organizations, in which he worked.

KEYWORDS Scientist, Missile Man, Mentors, Teachers, SLV-3, Failure, Opportunity, Missiles.

INODUCTION

India is the land of glorious history in the field of science and technology whether it is slave or independent. The mother India has given birth to so many great scientists from ancient time like Aryabhata in 4th century, Bhaskara in 7th century, C V Raman, Jagadish Chandra Bose, Megnath Saha, Birbal Sahni in 20th century. Nowadays Dr. A P J Abdul Kalam is sparkling in the sky of science and technology and is a role model of Indian Youths. Avul Pakir Jainulabdeen Abdul Kalam was born in a holy place Rameswaram on October 15, 1931. His father built and rented boat and he was the imam of the mosque. In childhood he fascinated with flight by watching birds, which developed into an interest in aeronautics after he saw a newspaper article about a British fighter plane. Kalam was a bright student who showed promise in science and mathematics. He attended St. Joseph's College and went on to earn a degree in aeronautical engineering from the Madras Institute of Technology.

After dashing his hopes of becoming a fighter pilot in the Indian Air Force, Kalam joined the Defense Research and Development Organization (DRDO) as a senior scientific assistant in 1958. After moving to the newly formed Indian Space Research Organization (ISRO) in 1969, he was named project director of the SLV-III, the first satellite launch vehicle designed and produced on Indian soil.

Returning to the DRDO as director in 1982, Kalam implemented the Integrated Guided Missile Development Program. He then became the senior scientific adviser to India's defense minister in 1992, a position he used to campaign for the development of nuclear tests.

Kalam was a key figure in the May 1998 Pokhran-II tests, in which five nuclear devices were detonated in the Rajasthan Desert. Although the tests resulted in condemnation and economic sanctions from other world powers, Kalam was hailed as a national hero for his staunch defense of the country's security and known as Missile Man.

In 2002, India's ruling National Democratic Alliance helped Kalam to win an election against Lakshmi Sahgal and become India's 11th president, a largely ceremonial post. Known as the People's President, Kalam . His immense popularity led to him being nominated by MTV for a Youth Icon of the Year award in 2003 and 2006.

After leaving office in 2007, Kalam became a visiting professor at several universities. He formed the "What Can I Give Movement" in 2011 with the goal of creating a compassionate society, and in 2012, his efforts to improve healthcare led to the release of a tablet for medical personnel to use in remote areas.

Among his many accolades, including honorary doctorates from 40 universities, he was granted the Padma Bhushan (1981), the Padma Vibhushan (1990) and the Bharat Ratna (1997) — India's highest civilian awards — for his contributions in modernizing government defense technology. He also wrote several books, including the autobiography *Wings of Fire* in 1999.

METHODOLOGY

The present paper is primarily based on secondary sources like the Books, Journals and Articles etc. The method used is historic-analytic method.

OBJECTIVE

- The objective of this paper is to analyze the conditions and circumstances for becoming a missile man of A P J Abdul Kalam. His education, his teachers, his mentors and opportunities helps for becoming a scientist.

LESSON FROM HIS FATHER

For shaping a life of a child, many things play important role like his family and social environment, his education, his teachers and mentors, his dreams and goals. Kalam was born such family which was fully devoted in God, honest and noble. He learnt honesty from his father. He recalled an incident, when he was studied in school. His father was elected Panchayat Board President by Rameswaram people. One day he was reading the lesson loudly under the kerosene lamp in his home and his parents had gone for Namaz. A stranger had come with some gift. He gave permission to put gift on father's cot. When father came back to home and saw gift items on cot he became angry on him and beat him. Then his father taught him by a quote of an Islamic Hadith "When the almighty appoints a person to a position, He takes care of his provision. If a person takes anything beyond that, it is an illegal gain." He told him that gift is always accompanied by some

purpose and a gift is a dangerous thing. It is like touching a snake and getting the poison in turn. This lesson stood out always in his mind.

ROLE OF TEACHERS

If the concept will clear, students can remember all learning things for long time. They can learn new things which based on previous knowledge. They never hesitated to learn new things. It helps to develop the ignited minds. Teachers have a very important role in students' life. They are fully responsible for clear all concepts and improving interest and confidence to learn new things. In Abdul Kalama's life teachers played important role to improve the interest in flight and in science. He recalled many incident about teaching methods of his teachers. One of these, when he was studied in class 8th at the age of 13, his teacher, Shri Siva Subramania Iyer was teaching about bird's flight. He drew a diagram of a bird on the blackboard depicting the wings, tails and the body structure with the head. He explained how the birds create the lift and fly. But many students including him could not understand the lesson. After knowing this, his teacher took all student to the sea shore of Rameswaram in evening. He showed the bird and taught the lesson. All students understood very clearly. But bird's flight entered in to him and created a special feeling. From that evening, he thought that his future study has to be with reference to flight and flight system. Thus his life was transformed as a rocket engineer, and aerospace engineer and technologist.

Second incident which generated confidence in him, was happened when he was studying in fifth class. Many of students of class got less than 40 marks in mathematics including him. His mathematics teacher asked them when you were getting more than 80 marks in other subjects, why were getting low marks in mathematics. Immediately, he evolved a method of teaching and creation of confidence for whole the class. After class, teacher conducted a exam of 10 problems. In this exam, more than 90% of the class including him got 100 out of 100. Then onwards his mathematics performance improved. Kalam felt after many years that his teacher the confidence injected in him that I can do it by his teaching.

In third incident, which introduce to him the ancient mathematicians and astronomers of India. It happened when he was studying first years B.sc in St Joseph's college, Tiruchirapalli in 1952. He got an opportunity of attend the one hour lecture of Adhayapaka Rathna T. Totadri Iyengar. He knew about Aryabhata who born in AD 476 in Kusumapur(now called Patna) was great astronomer and mathematician. On 23 years, he wrote Aryabhatiyam and he was first to give an approximation to Pi. He also knew about Brahmagupta, who born in AD 598 at Billamala in Rajasthan. At the age of 30 he gave Brahma Sphuta Siddhanta. He knew about Bhaskaracharya, who born in AD 1114 at Vijjalbad, border of Karnataka and Maharastra. He wrote famous Siddhanthasiromani. The glorious history of these three great persons influenced his thoughts and he always thankful of T. Totadri Iyengar.

The next incident, in which his teacher pushed him beyond his limit so that he recognized his true potential. When he was a student of aeronautics at MIT. He got a project to design a low level attack aircraft. With the team of four students, he designed aerodynamic. When completed project came in front of his design teacher Professor Srinivasan, who was also the head of institute, rejected his design and gave ultimatum to stop the scholarship if he could not submit this flawless design in next three days. Without scholarship he could not precede his study and his ambitions and dreams of his family would break. He got to work right away, determined to prove himself. He skipped his dinner and remained at the drawing board through the night. At second day evening his work was nearly complete- an elegant, neat design that he was proud of. Suddenly his professor came in his room and saw his design, he hugged him affectionately. Then he patting him on the back and said that he had known putting him under immense pressure when he rejected his work. He set an impossible deadline, yet he had met it with work that he could only call outstanding. As his teacher, he had to push him to his limits so that he could recognize his own true potential.

An incident which helped to improve his knowledge of hovercraft design and got a teacher who helped him in many critical situations. When he was working in Defense Research and Development Organization in 1958 at Aeronautical Development Establishment at Bangalore. Director of organization advised him for developing a design of a ducted contra-rotating propeller in Hovercraft configuration but he knew about conventional propeller design. He listened from his friends about Professor Satish Dhawan of Indian Institute of Science, who was well known for his aeronautical research, for help in designing the ducted contra-rotating propeller. After taking the permission of director Dr. Mediratta, he met Prof. Satish Dhawan and explained the problem about his project. Prof. Dhawan accepted that it was really a challenging task and decided to teach him in IISc between 2.00pm to 3.00pm on all Saturdays for the next six weeks. Kalam collected all reference material and books from him and read before attending the course. He considered as a great opportunity and started attending the discussion and started meeting him regularly. He influenced his teaching method because he taught with meticulous planning and prepared the student for acquisition of knowledge. After completion of course he got to capability for designing the contra-rotating propeller for a given hovercraft configuration. Later Prof. Dhawan helped him for solving the problem until the contra-rotating propeller test was not passed. This was the first designed in his career which gave him the confidence to design many complex aerospace systems. After some years Prof. Dhawan became Chairman of ISRO and that he got opportunity to work with him as a Project Director in the development of satellite launch vehicle SLV-3.

ROLE OF MANTORS

A few remarkable people came in his life at critical times and proceeded to mould his way of thinking. These people shaped his life. Ahmed Jalalluddin was one of them who changed the course of his life. Jalalluddin came in his life when he was a young boy and who was fifteen year older than he. He was also lived in Rameswaram and was not very

highly educated. He was only eighth class passed but had some knowledge of the English language. Jalalluddin met him when he helped his father for making a boat to start a ferry business. Kalam was fascinated with the way the boat was taking shaped and he had lot of queries in his mind. But all adults were too busy going about their work so no one gave attention to him. Among them, Jalalluddin noticed his interest and finished his queries. A young mind has lot of queries about nature and surroundings. Kalam also had lot of questions in mind and asked from Jalalluddin. He listened his questions very patiently and gave right answer of all questions. If he did not know the answer, he searched that answer from his level but never said no to Kalam. Jalalluddin was first person who noticed the immense curiosity and thirst for knowledge that flowed within him. Jalalluddin convinced his parents to send him Schwartz High School, Ramanathapuram for continuing education. He encouraged him for going different town and made the arrangements, travelled with him. Jalalluddin gave him positive thinking and gave the platform which helped him whole life.

Dr. Vikram Sarabhai was also the mentor of Kalam and played very important role in his life. Dr. Sarabhi was also a great scientist, an educationist, an institution builder and visionary. Kalam met him when he was called for an interview by INCOSPAR for the position of rocket engineer. Instead of field related questions, Dr. Sarabhai asked him about the possibilities and dream. Dr. Sarabhai provided the shade to his thoughts and dreams into his large vision for the country's space program. Kalam absorbed some great qualities from Dr. Sarabhai- first quality was ready to listen. He always ready to take advice from top to down manner. He always gave the importance to his juniors and subordinates. Second quality was the ability to think creatively. Dr. Sarabhai proved it by dealing two projects the SLV and the RATO at same time, which was not interconnected. Third quality was raising the moral of juniors and subordinates and a great ability to spot the right person for the job. He always praised them even if they had not completed their goal. Finally the great quality of Dr. Sarabhai was- to look beyond failures. If any project or system was failed, he used these mistakes as gateways for innovation and the development of new systems. These qualities influenced kalam's thoughts and visions.

FAILURE CONVERT THE OPPORTUNITY

After completing the engineering in aeronautical, Kalam went for fulfilling his dream. Aircraft was his first love. His wished for flying the aircraft. So he went to Dehra Dun for giving the exam of Indian Air Force. During examination he realized that along with qualification and engineering knowledge, they were also required certain qualities in the candidates like physical fitness and an articulate manner. He got 9th position out of 25 candidates but there were only eight places available. So he felt failure in examination and frustrated and depressed because his dream was broken. He felt that all ways had closed and nothing rest in his life. Then he went Rishikesh and took a dip in the Ganga. After dipping, he went the Sivananda Asharam that as located a little way up to hill. Where he met Swami Sivanand and told about his sorrow. Swami said him "Accept your density and go ahead with your life. You are not destined to become an air force pilot. What you are destined to become is not revealed now but it is predetermined. Forget this

failure, as it was essential to lead you to your destined path. Search, instead, for the true purpose of your existence. Surrender yourself to the wish of God.”

This lesson affected his thoughts and relieved his sorrow. He collected new energy and joined as senior scientific assistant at the Directorate of Technical Development and Production. Which exam passed in Delhi before coming Dhera Dun. This failure gave an opportunity for become a great scientist.

A MISSILE MAN

After completing his study, Kalam joined Defense and Development Organization. Where he designed a small hovercraft which name was Nandi, for the Indian Army. But early he got the opportunity to work in Indian Committee for Space Research, which became the Indian Space Research Organization, ISRO in 1962. He thanked to God for giving the opportunity to work with the father of Indian space research program Dr. Sarabhai and he learnt him about rocket technology. There he worked on the project of Satellite Launch Vehicle (SLV). After few years in 1972, he became project director in the development of first Indian satellite launch vehicle SLV-3 and which successfully developed the Rohini satellite in near earth orbit in July 1980. On 1 June 1982, Kalam joined again DRDO as the Director of the Defense Research and Development Laboratory (DRDL) at Hyderabad. There he involved in the project of indigenous development of missile system. He was appointed a chief executive of the Integrated Guided Missile Development Programme (IGMDP). Through IGMDP he developed five missiles- one was the surface-to-surface missile Prithvi, second was the tactical core missile called Trishul, third was the surface-to-air medium-range missile Akash, fourth was the anti tank missile Nag and fifth was the IRBM named Agni. Indira Gandhi, who was the prime minister of India that time, was impressed his work and efforts and allotted funds for the programs. He played a very important role in the Pokharan-2 nuclear test.

Dr. Kalam well deserved the title of the Missile Man of the country. He contributed his full life for developing the missile and rocket system.

CONCLUSION

Dr. APJ Abdul Kalam was the great scientist of aerospace engineering and missile technology. He spearheaded the space program of India and led it to great heights. He worked with the Indian government to expand the country's missile and space related projects. He prepared a big bench of good scientists in India and became a role model for them.

In childhood, he sold newspaper to support his family financially. He completed his engineering after getting scholarship. But his determination and big dreams made him a great scientist and the President of India. When he got new challenges, he never perplexed, he took that as an opportunity. He said

“I will not be presumptuous
enough to say that my life
can be a role model for

anybody; but some poor
child living in an obscure
place in an underprivileged
social setting may find a little
solace in the way my destiny
has been shaped.”

Kalam always motivated his subordinates and junior, when they faced failure in their projects. He always gave a vision for success which got from Dr. Sarabhai. He always motivated to youth for seeing the big dream.

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