



REMINISCENCES OF A DEFENCE SCIENTIST

A QUEST FOR SELF-RELIANCE

V NARAYANA RAO

**Defence Scientific Information & Documentation Centre
Defence Research & Development Organisation
Ministry of Defence, India**

**REMINISCENCES OF A DEFENCE
SCIENTIST – A QUEST FOR
SELF-RELIANCE**

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V Narayana Rao

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**Defence Research & Development Organisation
Ministry of Defence
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SELF-RELIANCE

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PREFACE

The growth in electronics research and applications has revolutionised our lives in the past 50-60 years. I have been fortunate to be actively involved professionally in the field of defence electronics over most of this period. Starting with my early work with Dr. Vikram Sarabhai in 1945, followed by my postgraduate education in the UK, and then my long career with the DRDO, I have been intimately involved with cutting edge applications in defence electronics. After a stint of four years at the Indian Institute of Science, I was at first, the Director of the Indian Naval Physical Laboratory (INPL) in Cochin for a major part of 8 years starting from 1954, and then became the first Director of the newly established Defence electronics research laboratory (DLRL) in Hyderabad, where I remained for 20 years until my retirement in 1982. After this, I had four more years of association with the DRDO in other capacities.

As Director of these establishments (INPL and DLRL), I was fortunate to have received enormous support from all the Scientific Advisers, and to have been given full freedom in crafting policy and setting direction, so as to achieve self-reliance and self-sufficiency in developing the necessary technologies in my area of specialisation, to meet the needs of the Armed Forces. With the help of a band of highly competent and dedicated scientists, we were able to successfully establish indigenous research, development and manufacturing capabilities in a wide range of critical military technologies such as cryptography, radar, electronic warfare systems, etc. In recognition of this work I received the VASAVIK award in 1978 and the Padma Shri in 1982.

Although I have since retired from the DRDO, I have kept myself informed of the activities and progress at DLRL. The Directors who succeeded me at DLRL have pursued these goals with equal vigour and over the following two decades, many more advanced systems have been developed at DLRL and manufactured by various agencies.

I received the Lifetime Achievement Award from the DRDO in 2003 and visited DLRL in 2004 in response to an invitation from there. This book is essentially an outcome of that visit and the address I gave the

scientists on that occasion on “The Turning Points in the History of DLRL”. I have gathered those ideas here and tried to describe through facts and explanations on how we have worked towards achieving self-reliance in many military technologies, and also included a description of Electronic Warfare systems, in which the DLRL has made a pioneering contribution. I have briefly recounted some of my early life experiences as well, to provide perspective and colorful contrast to the budding scientists of today. I hope that such a book would be of appeal to individuals and institutions, alike, interested in strengthening the technological base in our country.

I am grateful to Shri M Natrajan, Scientific Adviser to the Minister for Defence for his encouragement and support in getting this book published. I owe a great deal to Professor MGK Menon for his strong support to me, during his tenure in the DRDO, in making the DLRL play the crucial role in the EW field and now for his valuable Foreword for my book. I would like to thank my past colleagues in the DRDO, Dr CR Chakravarthy, Dr MD Raj Narayan, Shri N Divakar (Ex-Director DLRL), Shri G Kumaraswamy Rao (Ex-Director DLRL), Shri V Chander (Director NPOL), Dr R Sreehari Rao (Director DLRL), Shri A Bhagavathi Rao (CEO, GAETEC) for providing me some of the valuable material I needed for this book.

Further, I wish to express my appreciation for the encouragement and support given to me by my wife and daughters in writing this book. Finally, I have great pleasure in dedicating this book to my fellow scientists with whom I have had a long and close association, as well as to the bright young minds to follow.

Bangalore
January 2007

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CHAPTER 1

MY EARLY LIFE

1.1 INTRODUCTION

It is said that to fully understand a person, one needs to delve into his childhood experiences and family background. This is especially true in my case, where the humble beginning of my childhood and the strong family background I enjoyed, were great motivational forces in my life. Without the loving support and encouragement of my family and the values they had instilled in me, I might have taken a different path.

To the extent I have been able to find, my ancestors hail from the village of Vakkaleri which lies in the Malur Taluk of the Kolar District of Karnataka state, in Southern India. Some land had been gifted to them a long time back by the government and this was being cultivated from that time. There were ups and downs in the income from this property due to the vagaries of rainfall and weather. Not having much luck as landowners, they gradually shifted to the nearby large town, Kolar and took up what jobs they could find. My great grand father (Sripathi Rao) had five sons. I remember my father speaking a lot about one of them, namely, Krishna Rao, who received a law degree and started practising in Kolar. He used his success to help his brothers who did not do as well. He was of a very pious and charitable nature. Out of his savings, he built an Anjaneya temple in Kolar. The temple is located in central area and has been of great help to the people there. Recently, in 1992, the centenary of the temple was celebrated by the public and the trustees.

In 1899 or so, there was a plague epidemic in Kolar which took a toll of a large number of people. There was no medical help nor was there any knowledge available on how to control it. During this epidemic, my father's uncle, Krishna Rao and my father's father, Bheema Rao died. After another similar epidemic which occurred three years later, my father lost his mother. My father, Sripathi Rao who was just six year old and his elder brother who was 13 years old, thus became orphans at such a tender age. Their uncle Rama Rao took care of them for about seven more years, and

they continued their education at Kolar. My father then moved to Bangalore to stay with his elder brother who, by that time, had married the daughter off to a kind and benevolent gentleman, Ramachandra Rao. This gentleman also invited my father, who was just 13, to stay in his house and helped him in pursuing high school education. My father studied at the London Mission High School, which was one of the good schools and passed his matriculation examination with distinction. He was a very hard working and brilliant student and could easily have done well if he had gone for higher studies. But by then, he had already taken advantage of the kindness and help from his benefactor and did not want to tax him anymore. So, my father started looking for jobs and after a lot of effort, succeeded in getting a clerical post in the office of the Comptroller of State Accounts.

My father led a frugal life and remained a bachelor till he was about 23 years of age. After his marriage in 1915 to Kamamma, he took a small house on rent and settled in Chamarajpet, which was one of the well developed areas in Bangalore. My parents had two daughters before me and I was born on 21 December 1921. After me, my parents had two more daughters and three more sons. My father's salary had gone up by then and he had saved some money with which he bought a land in Visvesvarpuram, Bangalore. He then took a loan from a cooperative society and built a fairly big house and we all moved there.

My father had earned a very good name in his office for his hard work and efficiency. He passed all the departmental exams as a result of which he grew up in his career and reached the post of an Assistant Comptroller of the State Accounts. In 1942, he was deputed to the Hindustan Aircraft Company, Bangalore, as Deputy Accounts Manager for about four years. After retirement, my father led an active life and did some social service. He married off his daughters well and gave good education to his sons. The brother next to me, VSS Murthy, got a degree in mechanical engineering and joined the Nepa Paper Mills, where he rose to the position of the General Manager. The brother next to him, Raghunatha Rao, got a science degree and joined the Hindustan Aircraft Company and did well there. My youngest brother got an engineering degree with distinction and joined the Atomic Energy Department and rose to the position of Executive Director at the Nuclear Power Corporation. My father was responsible for the management of a hostel for poor college students and also Vidyapeetha, a Sanskrit institution started by the *Swamiji* of Pejawar Mutt. My father led a healthy life till his 87th year. The only sad part in his life was that my mother did not live long and she passed away at her 55th year. My father's uprightness, willingness to help others, and courage in adversity made a lasting impression on me and encouraged me to aim for higher goals, despite my humble beginning.

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