

## Raja Ramanna – Down the memory lane

### Raja Ramanna at TIFR

All those whoever had the opportunity to have some interaction with Raja Ramanna, always wondered how this individual with such diverse interests, charged with so many responsibilities and so many accomplishments and embellishments to his credit, managed to keep himself so cool, so collected, so calm, so easily approachable, always with a positive attitude, straightforward and transparent in his thoughts and dealings. As is well known, Ramanna was nuclear scientist of the highest order, a nuclear technologist, Advisor to the Ministry of Defence and even Minister of State for Defence in the Government of India, Chairman and Secretary to the Department of Atomic Energy, Chairman of the Governing Bodies of many top institutions, a Member of Parliament, besides being a philosopher, a musicologist and a musician. It is indeed a remarkable fact of history that Homi Bhabha, the Father of the Atomic Energy Programme of India, during one of his trips to London in 1947, had spotted and identified this young 23-year-old who had already obtained a Ph D from the London University, as one of the promising and potential leaders of the Atomic Energy Programme that was just beginning to take shape. Bhabha straightaway offered Ramanna a job and allowed him to stay on in London for another year or so to become familiar with the latest developments in the field of nuclear physics and nuclear technology in the UK.

Ramanna arrived in Bombay by the steamer *Jaljawahar* on 1 December 1949 and joined the Tata Institute of Fundamental Research (TIFR), which was then housed in the Old Yacht Club Building at Apollo Pier Road, next to the Gateway of India. It may be recalled that Bhabha always identified TIFR as the 'cradle' of the Atomic Energy Programme of India.

It has been my privilege to have known Ramanna right from the time he joined TIFR and this association lasted for 55 years.

When Ramanna joined TIFR, the institution had just been shifted from its first premises at Kenilworth, 54, Pedder Road, Cumbala Hills in Bombay to the Yacht Club premises and alteration work of the building was in full swing. The so-called servants' quarters of the Yacht Club were

converted as the hostel for unmarried scientists of TIFR. Bhabha, who had known Ramanna's interests and abilities in music, allotted him two adjacent rooms in the top-most fourth floor of the hostel, one for Ramanna and the other for his piano. The ground floor of the hostel became the nuclear physics laboratory of Ramanna, where he started his work on



Raja Ramanna (Photo 1956)

nuclear fission and neutron scattering. My work at the time was on cosmic-ray particle physics. Our professional interests overlapped considerably, particularly because of the common problem we faced of building suitable particle detectors and the associated pulse electronics. I just cannot resist pointing out that in the late 40s and early 50s of the 20th century that we are concerned with here, India was still backward in industry and in the field of electronics, imported radio communication electronics, was all that was available. There was no expertise on pulse electronics anywhere in the country. Also, books and journals had to come by sea and most of the journals were at least a year old. So, to work in advanced areas of nuclear physics and cosmic rays and keep pace with competitors in Europe and USA, was quite a challenge. Combined discussions and collaborative developments between our groups helped a lot. One saving grace was that there was plenty of discarded electronic components – valves, resistors, condensers, oscilloscopic tubes, etc. left by the US and UK military services – which had all been brought to India during the Second World War period. These had been cornered by some of the enterprising Chor

Bazar dealers at the Mohammedali Road, Bombay. Ramanna and I, along with some of our colleagues, used to venture into these areas in search of our needs. In those days, these were forbidden zones in Bombay because of communal disturbances and one did take a risk in going there. With these disposal equipments we built our amplifiers, scalars, pulse generators, and triggered oscilloscopes for our work in the advanced fields of research. I remember that some of the leading scientists of the time, who had come for the first ever International Conference on Elementary Particles organized by Bhabha at the Yacht Club building in December 1950, were amazed at the high quality of research that had been started in experimental physics in these frontier areas. Soon Ramanna obtained a Cockcroft-Walton type Cascade Generator and installed it in what came to be known as the Giraffe hut at the Holiday camp premises at the Lands End in Colaba, which is now known as Navy Nagar and where the present buildings of TIFR were still in the stage of construction. The recruitment and training of manpower for work on atomic energy had also started in TIFR – glass shop, workshop, vacuum pump fabrication facility, fabrication facilities for electronic equipments for radioactive mineral survey and so on. In 1953–54, the first team of atomic energy scientists with Ramanna as one of the key members, made a year-long visit to Paris to get familiar with the French work in reactor building and associated control instrumentation. In March 1955, the Atomic Energy Commission (AEC) of India decided to build a Swimming Pool Reactor at the newly acquired Trombay site. The fuel elements for this reactor came from the UK. The remarkable feature is that by August 1956, the Swimming Pool Reactor had become critical and operational for neutron physics research. All the mechanical parts were fabricated in the TIFR workshop and all the control electronics was made in the hutments of the Holiday Camp.

### Ramanna and the DAE Training School

In the oft quoted letter to Sorab Saklatvala, Chairman of the Sir Dorab Tata

Trust dated 12 March 1944, Homi Bhabha, while proposing the setting up of a fundamental research institute had said, '...Moreover, when nuclear energy has been successfully applied for power production in a couple of decades from now, India will not have to look abroad for its experts, but will find them ready at hand'. The concrete way of achieving this manpower development came about by the setting up of the DAE Training School in 1958 under the leadership of Ramanna and with the help of TIFR in the initial years. The modality of training was unique. Through thorough and elaborate interviews of science and engineering graduates with good academic records from all parts of India, the best of talent was identified for admission to the training school. Given courses by experts for almost a year, in various fields and then as members of different research groups at TIFR and BARC they were trained in theoretical methods, and experimental and analysis techniques and most importantly, they were given regular appointments in one of the centers of the DAE.

This scheme of identification, nurturing and training was so successful that over the last 56 years of its existence, the school has produced more than 6000 scientists and engineers who are manning various divisions of the Atomic Energy Establishment in different parts of the country. It is indeed remarkable that some of the older alumni of this school have achieved such distinctions as becoming Chairman of Atomic Energy and Space Commissions, Adviser to the Ministry of Defence, Directors of several leading laboratories, Secretaries to Science Departments of Government of India, senior professors at institutions like TIFR; some have moved to industry and some have settled abroad in good positions. Retrospectively, it shows that these pioneering steps taken by Bhabha and Ramanna in the years following independence, resulted in the creation of just the kind of technical manpower that India needed for scientific and technological advancement in at least some areas. It would have made a big difference if this successful model had been adopted in many other fields of scientific activity too.

As years rolled on, Ramanna got involved himself in many other activities of the Atomic Energy Establishment, played a key role in modernizing the technical aspects of our Defence forces and also

became a Member of Parliament. Yet the crowning glory of his achievements was the role he played as the first Director of the National Institute of Advanced Studies (NIAS), Bangalore.

### Ramanna and NIAS

NIAS is the brain child of J. R. D. Tata, whose birth centenary is being celebrated this year. Tata, inspired by the knowledge he had of the influence of the Grand Ecoles in France on a variety of developments had dreamt of setting up similar institutions in India, which would serve the important purpose of imparting multidisciplinary training to senior administrators, who are the real 'decision makers' in the government, in public and private sectors, and in industry – decisions which had direct influence on the future course of science, technology, industry and governance in the country. This grand vision of JRD could fructify only in the late eighties, when Ramanna retired as Chairman of AEC and agreed to take on the onerous and challenging responsibility of building of the type of institution that JRD had envisioned.

Ramanna, in the true style of Bhabha, who had as his motto – work first, and buildings and other infrastructure later – started organizing a series of courses for senior executives with the help of R. L. Kapur, who had joined him as full-time professor at NIAS. The first course was held at the Tata Management Centre, Pune and lasted for a full month. The topic of the course was 'Integrated approach to knowledge' and covered a wide variety of topics in history, economics, philosophy, sociology, psychology, caste, religion, panchayat raj, informatics, security problems of India, education, science and technology, and mathematics, all tailored to suit the personnel that attended the course. It may be interesting to mention that lectures were given by personalities like Romila Thapar, K. Subramanyan, Barlingay, Freddie Mehta, N. Mukunda, B. V. Sreekantan, A. Ravindra and so on. The subsequent three courses were held in Bangalore, Nagar Bhavi and Jamshedpur on similar lines. The permanent buildings of NIAS at the IISc Campus became available for holding courses only in 1992, and all the courses after 1992 have been held in Bangalore. Over a period of time, both the nature and

duration of the courses have changed and similar, but suitably tailored courses have been extended to many other sectors – IAS officers, university professors, readers, Indian Foreign Service recruits, ISRO officers and so on.

The towering figure of Raja Ramanna was chiefly responsible for attracting to NIAS many distinguished persons as short-term and long-term visiting professors, like anthropologist M. N. Srinivas and metallurgist C. V. Sundaram who joined NIAS in 1992, as soon as the new buildings at the IISc Campus were ready. I also joined this team in the same year. Around the five of us, namely Raja Ramanna, Kapur, Srinivas, Sundaram and myself, gradually younger scientists, philosophers, psychologists and social scientists gathered and research activities in various multidisciplinary areas got started, adding a new dimension to the scope and activities of NIAS. A novel feature that Raja Ramanna introduced to enhance the academic flavour of NIAS was the induction of several leading personalities from different walks of life as Associates of NIAS, which gave them the opportunity to attend all the special lectures, panel discussions, and selectively even national and international conferences organized by NIAS and held in its premises. Over the years, with the coming up of the elegantly designed J. R. D. Tata Auditorium and the tastefully developed gardens around, NIAS became one of the most attractive retreats with a characteristically different intellectual and natural ambiance of its own in the garden city. Though Ramanna retired as Director in 1997, he continued his association with NIAS and was present in NIAS on every working day, excepting when he was out of Bangalore. The NIAS faculty had fondly hoped that his benevolent presence and guidance would be available for many more years to come. Alas, this was not to be.

As Longfellow says:

*Lives of great men all remind us  
We can make our lives sublime,  
And, departing, leave behind us  
Footprints on the sands of time.*

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