

**M. Vijayan: A Life Among Men, Women and Molecules. Memoirs of an Indian Scientist.** Edited and Coordinated by A. K. Singhvi. Indian National Science Academy, Bahadur Shah Zafar Marg, New Delhi 110 002. 2020. x + 306 pages. Price: Rs 1500.

A reviewer should necessarily declare any conflict of interest. I shall begin by doing so. As a personal friend and long-term colleague of the author, I should not be reviewing this book. Nevertheless, when asked by the Editor, I could not resist doing so, as it would give me an opportunity to reflect on a life in science in India over nearly five decades, a period in which I had a ringside view.

Mamannama Vijayan arrived in Bangalore (now Bengaluru) in 1971, to join the faculty of the Indian Institute of Science (IISc). This was a time when organized funding for scientific research was scarce and the Ministry for Science and Technology did not exist. His initial home, a temporary one, was the Physics department, where he had obtained a Ph D, specializing in X-ray crystallography, a discipline first established in the institution by two of post-independence India's most accomplished scientists, G. N. Ramachandran (GNR) and Sivaraj Ramaseshan, both of whom were mentored by C. V. Raman. The Bangalore school of crystallography, which in later years was remarkably productive and influential, with Vijayan playing a major role, had a completely indigenous origin. In early 1974, Vijayan moved to the then newly established Molecular Biophysics Unit (MBU), established by GNR, to begin an independent scientific career, which would be both highly productive and immensely satisfying. In penning his memoirs, Vijayan provides an insight into his perceptions of the many events that unfolded over the years. Most remarkably, the book was written under extraordinarily difficult circumstances,

when a severe neurodegenerative disorder rendered the author almost completely physically incapacitated.

Vijayan provides a fascinating account of his early years, growing up in the village of Cherpu (*Wikipedia* now calls it a 'large village'), close to Thrissur in Kerala, where his father taught in the local school, rising to become the headmaster. His account of Kerala's complex caste and social relationships and his exposure to Communist politics as a boy is compelling. Kerala's strongly secular traditions, mostly misunderstood today, shaped his thinking as did the influence of Nehruvian ideals in India after independence. It may come as a surprise to a more modern generation of Indian scientists that much of science and most scientists in, the first decades after 1947, were similarly influenced. He confesses to his ambivalence about religion. 'I myself had mixed feelings about religion. As a boy, I remember a time when I used to visit a temple every evening, in wet clothes, after a bath, to pray. Subsequently I lost faith in temples except as cultural and community centres. Still some kind of religiosity is ingrained in the mind.' His deep roots in Kerala were evident when his first attempt at writing the story of his early years was in his native Malayalam (the only language I know, whose English rendition is palindromic). The book was proudly published by the Kerala Sastra Sahitya Parishad (KSSP), in 2016. The young Vijayan grew up in an atmosphere of leftist ferment, with E. M. S. Nambudiripad once staying as a guest of his parents, while underground at a time when the Communist movement was proscribed, in the years 1948–52. Active in student politics, in college, Vijayan rose to a leadership position in the Students Federation of India (SFI). An academically promising student, Vijayan was deflected from the political path by another of Kerala's astute politicians, C. Achutha Menon, later to hold office as Chief Minister, who saw in the boy an aptitude for higher studies. He would have been proud to have seen the heights to which his protégé eventually rose in science in India. Vijayan's transition, in the early 1960s, to a postgraduate Masters degree in Physics took him to one of the great centres of the subject, Allahabad University. Here amongst his teachers were Rajendra Singh, later to head the Rashtriya Swayamsevak Sangh (RSS), Murlī Manohar Joshi, later to

head the Bharatiya Janata Party and serve as Minister of Human Resource Development and Science and Technology in Atal Bihari Vajpayee's NDA governments of 1998–2004 and Sri Krishna Joshi, later President of the Indian National Science Academy (INSA), a position that would later cap Vijayan's illustrious career. His exposure to contrasting ideologies in Kerala and Allahabad, in his formative years, undoubtedly contributed to the broader world view that he developed over the years.

The transition from politics to science must have come at IISc, in the mid-1960s, when he worked for his Ph D in physics, specializing in X-ray crystallography, under the mentorship of M. A. Viswamitra, later to become a close friend and colleague. It was here that he found his calling, crystallography, and his wife, Kalyani. Vijayan's move to Dorothy Hodgkin's laboratory at Oxford, introduced him to a new world and influences that would shape the rest of his career. Few mentors in the world could have provided the kind of ambience that Dorothy Hodgkin, one of the most important figures of 20th century science, did at Oxford. Fresh from the triumphs of the structure determinations of penicillin and Vitamin B-12, recognized by the 1964 Nobel Prize in Chemistry, she had turned her attention to the protein insulin. It was here, while working on a spectacularly important project, that Vijayan learnt the craft of protein crystallography, then a very young field. It was also here that Dorothy Hodgkin presided over his marriage to Kalyani and later, in 1977, was to help usher in a daughter, happily named as Devayani Dorothy. Her visits to India in the 1970s and the many visits of Vijayan's Oxford contemporaries, all distinguished scientists, to Bangalore over the decades have contributed greatly to building and maintaining a strong momentum in macromolecular crystallography in India.

His description of the struggle to establish protein crystallography as a productive research area should be read by those who now practice protein structure determination as a routine activity. In the 1970s there was little by way of diffraction facilities and very little by way of computational resources, necessary for solving large structural problems. Producing proteins in quantities to facilitate crystal growth was a formidable task. Gene cloning and bacterial expression of

recombinant proteins lay in the future. As a bystander, witnessing the growth of the discipline, I can testify to the heroic efforts made to raise funds for equipment, negotiate a bureaucratic maze to place equipment orders and to create local conditions to maintain sophisticated equipment, when even air conditioners were a rarity. The structure determination of peanut lectin, which he accomplished in close collaboration with his biochemist colleague, A. Surolia, in 1985, marks a milestone in the history of crystallography in India. As the discipline grew in India, with new centres establishing facilities, Vijayan describes with evident satisfaction a presentation on macromolecular crystallography made to the Science and Engineering Research Council of the Department of Science and Technology: 'Macromolecular crystallography in India now is more than a gleam in the eye'.

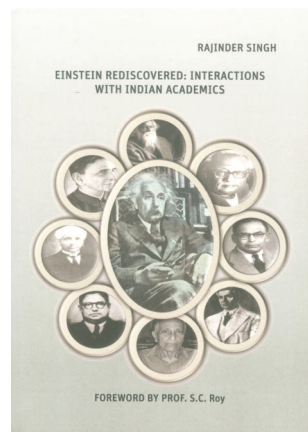
Vijayan narrates his memories of the early, turbulent, years of the department he joined, Molecular Biophysics Unit (MBU), established by GNR, with a vision to develop a new discipline, what would in time come to be known as, Structural Biology. In his later years, GNR was pleased that his expectations of the young men he recruited had, in large measure, been realized. Critical to the growth and development of MBU in the post-GNR years was Vijayan's unbounded energy and enthusiasm. By the mid-1980s a new talent was visible in Vijayan, one that comes through exceptionally well in his telling of the story. He welcomed and enjoyed administrative responsibility, bringing his considerable energies to the solution of institutional problems, of which there is no shortage in India's large institutions. In the period between the mid-1980s and his eventual formal retirement in 2004, Vijayan was involved in a multitude of activities both in IISc and elsewhere as the scientific establishment in India grew in size and scope.

In all successful careers, there are times of disappointment, of hopes dashed. Vijayan recounts, without rancour, the events of 1998, when he was passed over for the Directorship of the institution he loved, IISc. He was the clear front runner for all those inside the institution. Yet, when the time came he was ignored. His reaction to this event demonstrated both his loyalty and commitment to IISc and also the strength of

his personality, that permitted him to not only continue to serve the institution, but also to practically run the organization as the second in command. His remarkable memory for the many institutions he has been associated with testifies to the depth of his involvement, when assigned responsibility. His writing reveals not only his obvious enjoyment when confronted with protein structures, but also his great degree of comfort with academic administration. His devotion to the cause of science in India is clearly evident even in his recent writings in this journal, where he makes impassioned pleas for support of basic science by funding agencies, which increasingly demand unrealistic promises of instant translation to useful products. Vijayan's career spanning the years from the early 1970s to the first two decades of the 21st century has been a very important period in the growth of science in post-independence India. Vijayan has been an influential figure in Indian science over the decades. His story is one worth telling and certainly one that should be read.

P. BALARAM

*National Centre for Biological Sciences,  
Bengaluru 560 065, India  
e-mail: pb@iisc.ac.in*



**Einstein Rediscovered: Interactions with Indian Academics.** Rajinder Singh. Shaker Verlag GmbH, Am Lagen Graben 15a, 52353, Düren. 2019. xii + 163 pages. Price: 21.90€/27.40CHF.

The name Einstein has turned out to be almost like a dictionary word over various communities, scientific and otherwise. Being one of the great pillars of

modern physics and generally science, Albert Einstein had been approached by academicians all over the world to resolve their scientific issues and/or otherwise. The Indian community was also in touch with Einstein on various occasions. The book under review deals with this topic.

The book is particularly relevant at present, when many Indians are involved with the verification of gravitational waves, one of the most important outcomes of general relativity proposed by Einstein, which was confirmed observationally only in 2015–2016. Generally when the topic of Einstein and Indian science is brought in, the Bose–Einstein statistics is triggered in academicians' minds. The author, however, in this slim and concise book particularly aims to uncover Einstein's interaction and association with other Indians. It attempts to remove the myth that apart from S. N. Bose (hereinafter SNB), Einstein's association with Indians means that with politicians Mahatma Gandhi, Jawaharlal Nehru, and literature Nobel laureate Rabindranath Tagore (hereinafter Tagore), and so on. The book is timely, when we are not too far from 100 years of general relativity and discovery of gravitational waves. I find it a beautiful contribution with a nice writing skill. This is quite informative too. I however have some doubts and disagreements as well.

I proceed summarizing author's description and narrating my own view on the respective matters. The author begins by recalling Einstein's help to an Indian who was in a personal crisis. Aurobindo Mohan Bose (hereinafter AMB), who was incidentally nephew of famous scientist and academician Jagadish Chandra Bose (J. C. Bose), while in Germany had faced personal problems including financial issues. AMB had translated Tagore's poems and from his correspondence with Einstein it is evident that he had personal contact with Tagore. All the correspondence imply his very personal association with Einstein. However, given that AMB was also nephew of J. C. Bose and associated with Tagore, one wonders if Einstein allowed such a private relation because of AMB's personal background.

Next is the famous Einstein–SNB correspondence. However, as the main theme of the book is Einstein's correspondence with other Indians, the author has kept this part relatively brief.