



Calyampudi Radhakrishna Rao – As a Teacher in Calcutta School

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I first heard of Calyampudi Radhakrishna Rao (hereafter addressed as Rao) when our Professor at University of Bombay recommended two texts, one by Herold Cramer and the other by C. R. Rao. I bought both the books. I did not know that the two names were connected by the famous Cramer-Rao inequality.

In 1959 I applied for admission to the Research and Training School (RTS) of the Indian Statistical Institute (ISI) and I was very excited to receive a letter of admission signed “C. R. Rao”. That signature is still fresh in my mind.

I joined RTS in August 1959. That was before the Parliament passed the Indian Statistical Institute Act, 1959, which gave ISI authority to confer degrees. So, the RTS had full freedom to innovate and to experiment. We could even set an exam where all the students failed. And these were very bright students. Professor R. R. Bahadur set an exam on Sophistication and asked me to mark it to find out if the students were more sophisticated than the teachers! All this freedom vanished the following year when the degree programs were started.

Professor P. C. Mahalanobis had a very broad vision of Statistics. He wanted to explore applications of statistics across all sciences. Rao was entrusted with the task of incorporating this vision in undergraduate courses when the ISI started degree courses in 1960.

It was an exciting place full of enthusiasm. World renowned scientists visited ISI. I remember that to accommodate the travel plans of a famous scientist who was passing through Calcutta, Dr. Rao arranged a seminar at 11:00 PM and it was well attended.

The place had world renowned statisticians such as Mahalanobis, Haldane, Bahadur and Basu, to name a few. Any teacher or research student would announce a seminar for researchers interested in the topic. Varadarajan gave a series of lectures on Metric Topology, and it was attended only by Varadhan and me.

Research students did not have any prescribed course work nor any comprehensive exams. Students studied a topic and had discussions with other students and faculty. They would even give a series of seminars on the topic they were studying. They would find their own research topic and choose a faculty member to supervise the thesis

Rao was a great leader. He gave research students complete freedom. Faculty and research students could work on any area of mathematics or statistics. Research units were created for scientists working in special areas of applied statistics.

Rao took teaching very seriously. It was regarded as a sacred duty. Research students also took teaching responsibilities. They were groomed by senior teachers when they assisted by playing various roles. They set term tests and marked these. When they became more experienced, they would even teach a course independently.

Typically, at the RTS the teacher did not take any notes to assist in teaching. I too developed this habit when I started to teach.

During my first year at the RTS, I was asked to assist Rao in his Design of Experiments class. I attended the classes. I thought that I knew the subject, but I found that I knew only the mathematics associated with the subject but not the subject. He was a great teacher. He would call a student and ask him to work through a problem on the blackboard and help the student solve it on the blackboard.

During my second year he asked me to teach a one term course on Linear Estimation in six weeks saying that it could be done. When I agreed with this, he asked me to go ahead and do this. He gave me ten minutes to prepare and then to go and teach. After six weeks, he took over and taught the full course. The students learnt the niceties of the subject and I learnt how to improve my teaching.

I was intimidated by the brilliance of my fellow research students though nobody did anything to make me feel this way. I mentioned this to Rao and he did his best to allay my fears and concerns. He said that many research students go through such lean phases and eventually come out of it. This went a long way in building my confidence and getting me started.

To further build up my confidence, he assigned me some administrative tasks. ISI had just started a summer institute for Statistics teachers at the various Universities to expose them to current research in many areas of Statistics. Initially, he asked me to help organize this and later gave me the designation of Program Director to run this. He also gave me more latitude in later years.

Rao also encouraged me to join the tea club at the RTS. I did not know that research students could join. I looked forward to the teatime in the afternoon. The atmosphere was very relaxed, and the research students got to know the faculty better.

Kolmogoroff's visit in 1962 was an exciting event. We celebrated his 60th birthday during his visit. He came to Bangalore for the next summer course. Since he did not wish to stay at a hotel, he occupied the main guest room in the ISI building at 4, Richmond Road. Rest of us, including Rao and Adhikary, and I, occupied small rooms there. Since Kolmogoroff did not speak English, Adhikary interpreted his lectures.

Staying with these dignitaries under the same roof was an exciting time. Kolmogoroff's comments on the social structure and on individuals he came across were very insightful.

Next Summer Course was held on the campus of Andhra University in Waltair. I paid a courtesy call to the Vice Chancellor who introduced me to another person present as

an outstanding statistician. Obviously he mistook me for Rao but it was embarrassing to correct him. Rao, Basu, Varadarajan and my family occupied individual cottages in Motel Ocean View. It was a very pleasant time. He got to know Daksha (my wife) much better and took fatherly interest in her. This continued through the years. My daughter Swati was sixteen months old and did not yet walk. Rao would encourage us to accompany him and others to join them in evening walk on the beach saying that he would carry Swati, which he initially did and later on passed on the burden to others. During this stay at Waltair, Basu became seriously ill. Fortunately, he recovered soon.

Because of these two summer courses, Rao and my family got to know each other better.

I started working with J. Roy at the RTS and this continued for a year and a half. We wrote a couple of research papers jointly. After that he took charge of the new computer unit and would have no time to see me. I carried on with my work, found my thesis problem and solved it. When I showed this to Rao, he was quite pleased.

Throughout his career in India, he combined research with heavy administrative duties. He could do this because he had the ability to move from one to the other seamlessly. I would knock at his door and enter when he was deeply involved in a research problem. My purpose was to seek his guidance on some administrative issues. He would listen to me and give his advice. Next minute he would be back studying the research problem where he left it.

Rao took interest in students who graduated from ISI even after they left the Institute. In many cases he did this all through their career and helped them get appropriate positions.

I left ISI in 1964 to join Michigan State University as a visiting faculty. I returned to ISI in 1967 and then left for Waterloo in 1968 where I stayed till 2005 even though I formally retired in 2002.

Rao set up a branch of ISI in New Delhi where Graduate degree courses were given. I visited there during one of the early years of this and stayed a full year. He nurtured this branch in the same way as he did nurture the RTS in Kolkata.

A few years later he retired from ISI and spent the rest of his career in the U.S.

Rao visited Michigan State University during my stay there and visited Waterloo several times when I was there. He and Mrs. Rao stayed with us during one of these visits. Additionally, I met him at various conferences. Hardly a year went by during which we did not meet. His interest in me and his guidance continued.

He was a professor at various universities in the U.S before his retirement at Buffalo where he stayed with his daughter Tejaswini. I visited him there several times. The painful expression on his face when he saw me with my left arm amputated, touched me deeply.

Tejaswini did a great job in preserving and organizing photos of Rao with several dignitaries throughout his illustrious career. She arranged these and other documents associated with his career like a museum.

She also did a superb job in arranging 100th birthday celebrations for Rao. Unfortu-

nately, because of covid this had to be done on Zoom. It was a memorable event.

In conclusion, I must say that I feel very lucky to have known him. He touched so many lives and mine was one of these.