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Guest Editorial

DR. BAL KRISHAN ANAND

It is 50 years since the discovery of the "feeding centre" in the hypothalamus by Anand and Brobeck. This Anand is none other than Dr. Bal Krishan Anand, who is the leading light in the field of Indian Physiology. Dr. B. K. Anand, the founder member of the Association of Physiologists and Pharmacologists of India, was born on 18th September 1917, at Lahore (now in Pakistan). He was brought up under very difficult circumstances. From a humble beginning, Dr. B. K. Anand achieved the height of glory in medical research, which any Indian can feel proud of. His life is a story of achievements which every Indian should read and get inspiration from. His father died before he was born, and his mother had a difficult time in bringing him up. Bal Krishan (as Dr. B. K. Anand was called) was brought up by his grandparents, who were not financially well off. Unfortunately, his grandfather also passed away when Bal Krishan was in class six. He finished his matriculation and joined Government College, Lahore for doing FSc (Medical Group) in 1933. He earned a scholarship for two years of college studies, as he stood third in the matriculation examination. Bal Krishan had to economise on food and some other requirements to save money for buying decent clothes. He used to iron his clothes and polish his shoes regularly. This childhood habit of presenting himself in the most appropriate dress for the occasion did not leave him even till late in his life. In college, he looked like any other student, and except for a few friends who had known him for a long time, none knew about his humble background. As he stood second in the FSc examination, he not only got a seat in King Edward Medical College, Lahore, but also a scholarship for studying there. He was always among the top students in the class in every professional examination. Therefore, his scholarship continued for the entire duration of the MBBS course. Besides, he also won several prizes, medals and certificates during the course. After getting his MBBS in 1940, he joined the state Medical Service in 1942. Dr. Anand took his MD (Medicine) examination in 1948 with three subjects: Medicine, Pathology and Physiology.

The real turning point in life for Dr. B. K. Anand came in 1951 when he was working in Prof. John Fulton's laboratory in Physiology at Yale University School of Medicine, New Haven, Connecticut, USA. His work there with Prof. John Brobeck led to the discovery of neural substrate which

is responsible for regulating feeding. Dr. Anand's discovery led to two publications in quick succession: one in the May 1951 issue of the Proceedings of the Society for *Experimental Biology and Medicine* and another in October, 1951 issue of the *Yale Journal of Biology and Medicine*. Both these papers have been extensively quoted in subsequent work in this area as well as in textbooks. It is most interesting to hear from the "horse's mouth" the story of the discovery of the "feeding centre". I am narrating below the story, as told by him in one of his lectures in the Department of Physiology, All India Institute of Medical Sciences (AIIMS), New Delhi.

Dr. Bal Krishan Anand, was the first Rockefeller Foundation Fellow from India, to join Dr. Fulton. Dr. Anand was put to work with Prof. Brobeck, who taught him how to approach, experimentally, a specific part of a rat's brain, using the stereotaxic technique. Prof. Brobeck showed him that the destruction of a tiny part of the hypothalamus in the brain turns the rat into a voracious eater, and it ends up getting fat.

Prof. Brobeck gave him six rats to repeat the procedure all by himself. But the rats, instead of turning into voracious eaters, stopped eating. They could not be induced to eat the food even when it was placed in their mouths. The rats preferred to die rather than to eat. Dr. Anand checked and rechecked all his steps. All the steps were right. Dr. Anand, knows the dictum that "the observations are never wrong, but the explanations may be." His fertile mind worked out a hypothesis. There are two mechanisms in the hypothalamus located in regions very near each other; one, which stops us from eating, and the other which makes us eat. He hypothesised that while Brobeck has been destroying the former region, he had destroyed the latter. The question which he asked himself was "why had he consistently ended up destroying (or lesioning) a different region of the brain, if he had followed exactly all the steps that he was taught." Therefore, Anand felt that there might be something wrong in his hypothesis, though Brobeck insisted that there was something wrong with Anand's technique. Anyway, when they did the post-mortem histology of Anand's rats' brains, they found that Anand had made giant lesions in the rats' brains instead of small lesions as Brobeck had been making. They then found out that the instrument which they used for making lesions suddenly started delivering a current of 20 milliamperes, though it was set at two milliamperes. The observation was a morale booster for him, as he did not have to lose face before his teacher, as his technique was right. He then tried to explain his finding by hypothesising that the big lesions destroy both the feeding and satiety mechanisms. They then performed fresh experiments with small lesions in the neighbouring areas of the ventromedial hypothalamus. Subsequent studies proved Anand's hypothesis to be right.

When it was time to leave USA, Dr. Anand requested Prof. Fulton to find some way which would enable him to take some equipments to India for continuing his research studies there. Prof. Fulton personally requested the chief of the Rockefeller Foundation Fellowship Programme to sanction a grant for purchase

of equipment for Dr. Anand as a very special case. The request was granted, and Dr. Anand was allowed to bring with him an oscilloscope, a pre-amplifier, an electronic stimulator and a Horsley-Clarke stereotaxic instrument. These were the only equipments available to Dr. Anand during the initial years, after he returned to India. These equipments are still kept in the department of Physiology at AIIMS. He used it successfully to conduct several studies, which enabled him to attract research grants, which in turn brought more equipment in subsequent years.

Dr. Anand finally returned from this highly creative, productive and eventful sojourn abroad to his motherland in February, 1952. At that time, they were planning the establishment of a nucleus of excellence in the medical field at New Delhi. Naturally, some reputed medical persons were required for participating in the planning process. Dr. Anand was included in the group involved in planning the envisaged medical centre (finally christened as the All India Institute of Medical Sciences). The Health Minister of India at that time, Raj Kumari Amrit Kaur, personally requested Dr. Anand to join the team. As a result, after a six month stint at Amritsar, Dr. Anand was in Delhi as Professor and Head of the Department of Physiology at Lady Hardinge Medical College. Simultaneously, he was also inducted into the group which was planning for the AIIMS. Although he made important contributions to the entire process, his major responsibility was to prepare a report on the requirements for the Departments of Physiology and Biochemistry. Ultimately when the AIIMS came into existences, Dr. Anand was appointed as the Professor of Physiology.

Dr. Anand led the Department of Physiology at AIIMS from 1956 through 1974. He considers this the most productive period of his career. He attracted a large number of students and quickly built up an impressive team. Together with his students he extended the work on food intake initiated at Yale, and diversified into few new areas as well. The result was more than 100 papers, national and international recognition for the department, and a string of honours and awards for Dr. Anand and several of his co-workers. Dr. B.K. Anand always claimed that his greatest asset in life is the team of his students, and the Department that he had built up at the AIIMS. He never compromised on principles. He had always believed that it is the duty of the teacher to look after the interests of the students. I can recall one personal incident. When I was working for my PhD under Dr. G.S. Chhina and him, there was a vacancy for the post of Demonstrator in the Department of Physiology, AIIMS. I went to Dr. Anand to get my application for the post forwarded, as it was a requirement, as per rules. Dr. Anand looked at me and asked me, "Did I ask you to apply?". I was taken aback by the question. I meekly told him that I would not apply if he did not want me to do so. Then he told me that it was his duty to look after the future of all his students, so that they could attend to their work without wasting their energy in unnecessary activities like applying for various posts. He kept his word, he told me when and where I should apply. The incident

showed that, true to the ancient Indian tradition of the close teacher-student bonds, he keenly watched over the interests of his students.

I would also like to mention another incident. This happened when I was working as demonstrator. I was asked to go to the cyclostyling section and make copies of an undergraduate examination paper. That was the first time I was seeing a cyclostyling machine. I cyclostyled the question paper and brought them back to the department. Somehow, one copy was left behind by mistake. Within a few minutes, this copy reached Dr. Anand, who was the Dean of AIIMS at that time. The incident was a big blow to Dr. Anand, as it concerned the Department of Physiology. Dr. Anand immediately called me, and asked me to explain. I had no answer. He asked for my resignation, and I submitted the same immediately, without any hesitation, as I knew that I was wrong. After submitting my resignation, I went to the railway station and bought my ticket for going home. Next day I did not go to the department, as I was busy packing my luggage. When I almost finished packing, there was a message from Dr. Anand to meet him immediately. I went to him and he asked me as to why I had not come to the department. I told him that I was getting ready to go home. Then he took out my resignation letter and tore it in front of me and asked me to go to the department and attend to my work. This episode illustrates only too well the deep compassion underlying his strict sense of discipline.

Dr. Anand took voluntary retirement from AIIMS in 1974 to join the World Health Organization as advisor on Health Manpower Development in the South East Asia Region. After a few years' stint in WHO, he returned to his home turf, ie the Department of Physiology, AIIMS, where he now serves as Emeritus Professor.

In this write-up, I have relied heavily on the Biography of Dr. B. K. Anand, written by Prof. R. L. Bijlani.

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