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PRAFULLA KUMAR BOSE

(1898 - 1983)

Elected Fellow 1944

PARENTAGE AND EDUCATION

PRAFULLA KUMAR BOSE was born at Belghoria in the district of 24 Parganas, West Bengal on September 5, 1898. He was the eldest son of Upendranth Bose, a man of common means but he had a deep sense of ethical values based on hard, honest work and creativity. As a child Prafulla Kumar was energetic and possessed insatiable curiosity for things around him. His father, through hard and honest work, set before him an inspiration for working hard in his studies. His efforts began to be fruitful even from the very beginning of his school career and he obtained a scholarship in the upper primary examination (Class IV standard). On the basis of results of the primary examination he was admitted to Dhankuria High School in the district of 24 Parganas where he enjoyed residential free studentship upto Matriculation Examination. Here he imbibed the qualities of leadership in academic matters especially in debate classes. He passed the Matriculation Examination of Calcutta University in 1916 with a high score. In 1918 he passed ISc Examination from Vidyasagar College, Calcutta and obtained a silver medal for his performance in the University examination. He then took up BSc course with Honours in Chemistry at St Xavier's College, Calcutta.

At St Xavier's College, he came in contact with Father Professor van Naste, a teacher with dynamic personality and high teaching qualities. Professor van Naste had a great affection for his students, specially for those who were very devoted to their studies. Young Bose's devoted and inquisitive character attracted attention and affection of van Naste. He nurtured the academic qualities of young Bose with a great care. Perhaps he found in him a growing scientist. Bose passed the BSc examination with Honours in Chemistry of Calcutta University in 1920 standing first in first class securing the University gold medal. It was Professor van Naste who introduced young Bose to Acharya PC Ray before entering the Post-graduate courses in chemistry. Due to his brilliance in academic matters and amiable manners, PK Bose endeared himself to Acharya Ray. It was under his constant inspiration, care and attention that Bose engrossed himself specialising in organic chemistry. In 1922, he passed the MSc Examination of Calcutta University and stood first in first class and obtained the University gold medal.



Acharya Ray who had a great interest in Ancient Hindu medicine, specially in uses of sulphur and the medicinal plants induced Bose's interest in chemistry of organic sulphur compounds. Bose obtained the DSc degree in 1927 from Calcutta University under the supervision of Acharya Ray. His dissertation included sulphur compounds of medicinal value. While working in the laboratories of Acharya Ray, he came in contact with the then young scientists like BC Guha, HK Sen, JN Roy and others, with whom he had very close ties till the end of their lives. Later on Dr PK Bose obtained PRS studentship (Mowat medal) and Nagarjun award of Calcutta University which are very coveted distinctions for a research student of Calcutta University. Later on he was absorbed as a Lecturer of Calcutta University in the Department of Pure Chemistry. In 1933, he proceeded to Europe for higher training in organic chemistry obtaining Ghosh travelling fellowship of Calcutta University. This was a rare distinction for a research worker at that time.

In Europe, he worked with Professor Wieland and had training in microanalytical techniques. Subsequently, he worked with Professor E Späth at Vienna. His sojourn with Späth at Vienna was very fruitful. Here he got interested in the chemistry of natural coumarins and alkaloids. He continued his collaborative work with Späth even after coming to India. This resulted into structure elucidation of some newer coumarins from Indian plants.

PROFESSIONAL CAREER AND SCIENTIFIC CONTRIBUTIONS

He rejoined Science College as a teacher in chemistry. As a teacher he believed that the elegant way of the exposition of the art of teaching was very important. He used to teach chemistry in Postgraduate classes in a very elegant fashion which created a deep impression on the students. This earned him a high esteem as a teacher from the student community. In the area of research he continued his investigations on the chemistry of various types of constituents of Indian medicinal plants with special reference to coumarins and alkaloids and their biochemical properties. Here he started work on the chemistry of indole alkaloids. In his endeavour to develop a stream of investigators, he got (Mrs) Asima Chatterjee (nee Mookerjee) as a devoted research worker. In 1941, Dr Bose left the job of Calcutta University and joined the Government of India as a Deputy-Director of Drug and Dressing at Delhi. The School of Natural Products Chemistry which Dr Bose initiated to build up at the University of Calcutta obviously got a set-back. Later on his devoted research student, Dr (Mrs) Asima Chatterjee took up the challenge to build up the School and to brighten the light that was kindled by Dr Bose. The School under the leadership of Professor (Mrs) Chatterjee has now earned a worldwide recognition and reputation as a very good school of studies in natural products chemistry.

After spending nearly four years at Delhi as the Deputy-Director, Dr Bose joined the Indian Lac Research Institute at Ranchi in 1945. From his work and experience at the Lac Research Institute, Bose wrote out a monograph on Indian lac. Dr Sadhan Basu came to Indian Lac Research Institute at that time and worked under him. Dr PK Bose inspired Dr Sadhan Basu who is now one of the most eminent physical chemists of India. In March 1954, Dr Bose joined Bose Institute, Calcutta as the Professor and Head of the Department of Chemistry. He again started his investigations on the chemistry of natural products and got around him a group of associates and PhD students. Due to his wider outlook and the dedications of workers around him, the chemistry department of the Institute got reorganised, under his Headship, with a new look.

Professor Bose got interested in different aspects of the chemistry of natural products. Newer diterpenes, triterpenes, coumarins and alkaloids received adequate attention in his programme of work. He also took up the problem of chemonastic substances in *Mimosa pudica* Linn. In this particular project he and his co-worker continued till 1960. From their investigations, it was revealed that the problem required more rigorous biochemical approach. Besides the structural work of various plant constituents, the biochamical and physical properties of natural products engaged his attention. The antibiotic properties of various natural products are few of these areas in which Professor Bose showed his interest.

The profile of the Chemistry Department of Bose Institute took a homogeneous look under the coordinating activity of Professor Bose. In his endeavours he received very sincere cooperation from his associates like Dr A Sen, Dr SK Roy, Dr DP Burma, Dr SP Sen and Dr AK Barua at the beginning. All his associates in latter phase, became reputed workers by virtue of their own contributions. Sri BB Biswas, the present Director of Bose Institute, Sri DP Chakraborty and Sri J Dutta joined Bose Institute as graduate students in 1954. At the end of Professor Bose's tenure as the Head of the Department, the profile of the department of chemistry emerged as though different units of the department were engaged in the investigations in the coordinated field of Structure and functions of biomolecules of Plant origin.

Professor PK Bose's mission as a teacher could be considered very successful. The quest of new knowledge initiated by him at the University College of Science, Calcutta, continues to proliferate, specially due to the emergence of a school of natural products chemistry under the leadership of Professor (Mrs) Asima Chatterjee. His efforts in the latter part of life at Bose Institute has sufficiently been prized by emergence of a band of workers now continuing investigations in different facets of natural products chemistry at Bose Institute.

In 1964, he was promoted to the position of the Joint-Director of Bose Institute in which post he continued upto 1965. Later on he worked as an Emeritus Scientist under CSIR at Bose Institue upto 1970.



Besides Professor Bose's interest in active research work, he had a special acumen in editorial work of scientific journals. In this respect his contributions to the development of the journal entitled Annals of Biochemistry and Experimental Medicine now known as Indian Journal of Biochemistry, requires special mention. His friend and admirer, Dr JC Roy, Director of the Institute of Biochemistry and Experimental Medicine depended largely on him for bringing out this journal.

Professor PK Bose is a historic figure in the development of the chemistry of natural products in India, specially in the eastern region. He could be considered to belong to a generation of natural products scientists of India like Professor JL Simonson, Professor BB Dey, Professor RN Chopra and Dr S Siddique whose initiations in the different facets of natural products chemistry have earned India a respectable position in the world map of investigations in this area.

HONOURS AND AWARDS

Professor Bose was elected a Fellow of the Indian National Science Academy in 1944. He was associated with Indian Science Congress Association (ISCA) as its Treasurer. He was also elected President of the Chemistry Section of ISCA. He was the President of the Indian Chemical Society for the years 1957-58. He was the President of Indian Science News Association.

He delivered the HK Sen Memorial Lecture of the Institute of Chemists, India in 1957 and Acharya PC Roy Memorial Lecture of Indian Chemical Society in 1960.

After his retirement from active science work, he continued as one of the editors of the Journal *Everyman's Science* published by Indian Science Congress Association till his death on 29th October 1983.

FAMILY AND PERSONAL LIFE

Professor PK Bose was married to Smt Kamala Bose in 1934. He had a successful family life and was very affectionate to his daughters and grand children. His family life was marked by peace and tranquility. One of his daughters Dr Sakuntala Bhattacharyya (nee Bose) is a PhD in Botany of Calcutta University and is now an Officer in NCERT. He was a good sportsman in his younger days and he was specially interested in playing tennis. His interest in dance and drama culminated into a longstanding friendship with the great Indian creative dancer Uday Shanker whom he met in Europe in 1933.

Professor Bose was extremely fond of children and always found time to play with his daughters. He was so considerate to persons around him that when he had a young servant from Calcutta, he used to play ludo with everyday. Secretly, he used

to help a number of needy people with money, which his family members came to know after the expired. He never scolded or got angry. He was always willing to answer scientific questions posed by children. He had a great sense of humour He enjoyed music and loved visting the theatre. He also enjoyed sports. He was very absent minded especially if he was deep in a problem. He was very particular that his daughters spoke nicely to the servants. He would never scold them if they did someting wrong, as long as they owned up. He hated hypocracy.

Professor Bose was confined to the bed for last two years of his life. He passed away peacefully, due to cardiac arrest, at his residence in Calcutta in the early hours of October 29, 1983.

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DP CHAKRABORTY

BIBLIOGRAPHY

- 1924. Thiodiazines. Part I. Condensation of thiosemicarbazide with ω-bromoacetophenone.

 J. Indian Chem. Soc., 1, 51.
- 1925. Thiodiazines, Part II. Condensation of ω -bromoacetophenone with 4-substituted thiosemicarbazides. The constitution of thiosemicarbazides. *ibid*, 2, 95.
- 1926. Thiodiazines. Part III. Hydroxy thiodiazines. ibid, 3, 148.
 - Thiodiazines. Part IV. ibid, 3, 197.
- 1927. Benzidine rearrangement in heterocyclic series. Part I. ibid, 4, 331.
 - (With ROYCHOWDHURY DC) Thiodiazines. Part V. Studies in thiosemicarbazone series.
 ibid, 4, 257.
- 1928. (With SEN BK) Benzidine rearrangement in heterocyclic series. Part II. ibid, 5, 643.
- 1929. (With BHATTACHARYYA T and Roy JN) A new synthesis of quinazolines Part I. ibid, 6, 279.
- (With Das Gupta BC) Benzidine rearrangement in Heterocyclic series. Part III. ibid, 6, 495.
- 1930. (With NANDI BK) Thiodiazine. Part VI. ibid, 7, 733.
 - (With Nandi BK) Thiodiazines. Part VII. Condensation of ethyl chloracetate with thiosemicarbazide. ibid, 7, 961.
- 1931. (With Nandi BN) Thiodiazine. Part VIII. Action of ethyl chloroacetate upon thiosemicar-baozide. ibid, 8, 311.
- 1935. (With RAM S) On colour and reaction of nitrocompounds. ibid, 12, 687.
 - Active principle of Piper chaba Hunter. Sci. & Cult., 1, 111.
- 1936. (With BHATTACHARYYA SN) On colouring matters of Oroxylum indicum. ibid, 1, 581.
 - (With Guha NC) On some synthetic compounds related to atophan. J. Indian Chem. Soc., 13, 700.
 - (With Roy AC) The constitution of ayapanin. ibid, 13, 586.
- 1937. (With BHATTACHARYYA SN) On the constitution of an acid isolated from pineapple. Sci. & Cult, 2, 162.
 - (With Guha NC) On the constitution of gardenia . ibid, 2, 223.
 - (With Guha NC) On the crystalline constitutents of Seseli indicum. ibid, 2, 326.



- (With Mookeejee Asima) Natural glucosides. Part I. The constitution of the glucoside present in Murraya exotica. J. Indian Chem. Soc., 14, 489.
- (With Spath E and Schlager J) Konstitution und synthesis von Ayapin XXVI. Mittel uber Naturlische cumarine. Ber. dtsch. Chem. ges., 70, 702.
- (With Spath E et al) Die Cumerine von Seseli indicum und die Konstitution des sesslins. ibid, 70A, 83.
- 1938. (With Bhattacharyya SN) Natural Flavones. Part II. On the colouring matter of the Bark of Oroxylum indicum. Vent. J. Indian Chem. Soc. 15, 311.
 - (With FINLAYSON HH) Occurrence of Psoralen in Phebelium argentuu Smith. ibid, 15, 516.
- 1939. (With Bose JL) Natural Flavones. Part III. On the constitution of tambulin. ibid, 16, 183.
- 1940. (With DUTT PB) Natural Flavones. Part IV. The yellow colouring matter of Blumea erianth D.C. ibid, 17, 45.
 - (With DUTTA PB) On the constitution of Pedicinin. ibid 17, 499.
 - (With DUTTA SK) Investigations on the oil from the fruits of Ferula alliacea Bioss. ibid,
 17, 49.
 - (With DUTT PB and DEB NC) A preliminary note on Mesuol, the bitter principle of Mesua ferrea Linn. J. Indian Chem. Soc., 17, 277.
 - (With Spath E et al.) uber die Konstitution des Luvangetine Liv. Mittel uber naturliche coumrine. Bev. dt sch. chem. Ges., 73, 1361.
- 1941. A new source of caffeines. Sci. & Cult., 6, 554.
- 1941. (With SEN PB) New Haemostatic agents. Part I. Experiments with Ayapinin and Ayapin. Ann. Biochem. Exptl. Med., 1, 311.
- 1944. (With Mookerjee A) On the constitution of natural coumarins isolated from Luvanga scandens. Ham., J. Indian Chem. Soc., 21, 181,
- 1945. Natural flavones. Further observations on the constitution of gerdenln and tambulin. *ibid*, 22, 233.
- 1946. (With CHAUDHURY JC) Constitution of coumarine isolated from Ferula alliaceae. Ann. Biochem. & Exptl. Med., 6, 1.
 - (With Mookerjee A) On the constitution of the alkaloid isolated from the bark of Chloronylon swietenia D.C. J. Indian Chem. Soc., 23, 1.
- 1948. (With BHOWMICK T AND BASU S) Polycondensation of aleuritic acid (I). J. Sci. Industri. Res., 7B, 153.
- 1949. (With Bhattacharjee A and Chatterjee A) Alkaloids of Kopsia fruiticosa, I. Amer. Chem. Soc., 71, 3310.
- 1951. (With BHATTACHARYA PR) Studies on Aleuritic acid. Part II. Catalytic polycondensation. 1, Sci. Industri. Res., 10B, 51.
- 1954. (With Sankarnarayanan Y) A new method of determination of bleach index of lac. ibid., 13B, 506.
- 1956. (With CHAKRABORTY DP) Paper chromatographic studies of some natural coumarins. J. Inian Chem. Soc., 33, 905.
- 1957. (With RAO KV) Constituents of Pisticia integerrima galls. Sci. & Cult., 22, 515.
 - (With CHAKRABORTY DP and DASGUPTA A) On the anti-fungal properties of natural coumarins. Ann. Biochem. Exptl. Med., 17, 59.
- 1958. On some biochemical properties of natural coumarins. J. Indian Chem. Soc., 35, 367.
- 1956-68 (With RAO KV) Constituents of galls of Pisticia integerrima. Studies in the structure of two triterpene acids, pistacienonic acids A & B. Trans. Bose Res. Inst., 21, 23.
 - (With BARUA AK) Triterpenes from Luffa cylindrica Roem. ibid, 21, 19.
- 1959. (With RAO KV) Structure of aegiceradionol, a new triterpens alcohol from Algicerus majus. Gaertn. Sci. & Cult., 24, 486.



- (With RAO KV) Isolation of Ganin A and isorahmnentins from Aegicerus majus. Gaertn. J. Indian Chem. Soc., 35, 358.
- (With CHAKRABORTY DP and PURAKAYASTHA M) Proc. Natl. Inst. Sci., 15B, 1.
- 1959-60 (With CHAKRABARTI SK) Attempted synthesis of psoralidine. Trans. Bose Res. Inst., 13, 55.
- (With Chakraborty SK and Banerjee AK) Natural Flavones. Part IV. The yellow pigment of flower of Helirhrysu aumn. ibid., 13, 59.
- 1960. Recent advances in the chemistry of bitter principles containing b-substituted furan ring.

 J. Indian Chem. Soc., 36, 653.
 - (With CHAKRABORTY DP) On the constitution of Mesuol, the bitter antibiotic principle of Mesua ferrea Linn. Proc. Natl. Inst. Science, 16A, 1.
- 1961. (With RAO KV) Chemistry of Aegicerus majus Gaertn. Part III. Tetrahedron, 18, 461.
 - (With CHAKRABORTY DP and SEN M) On the antibiotic properties of natural coumarins.

 Trans. Bose Res. Inst., 14, 31.
 - (With RAO KV) Chemistry of Aegicerus majus. Part 1V, Some minor constituents. Ann. Biochem. Exptl. Med., 11, 355.
- 1962. (With CHAKRABARTI SK and Roy AK) Triterpenes from seeds of Albizzia lucida, Benth. Sci. & Cult., 18, 385.
 - (With CHATTERJEE A and SAHA SK) Die Chimie des Ferullus des Grundlactones der in indiechem arazneiplanze, Ferula alliceceae Boies. Arch. Pharma., 195, 248
- 1963. (With MUKHERJEE DK and BARUA AK) Chemical investigation of Ougeinia dalbergioides Benth. Sci. & Cult, 19, 257.
- 1964. (With CHAKRABORTY DP and BURMAN BK) On the structure of Girinimbine, a pyranocarbazole derivative isolated from *Murraya koenigii* Spreng. *ibid*, 30, 445.
- 1965. (With CHAKRABORTY DP and BURMAN BK) On the constitution of Murrayanine-a carbazole earbazole derivative isolated from Murraya koenigii Spreng. Tetrahedron, 21, 681.
 - (With Das KC and Charaborty DP) Antifungal activies of some constituents of Murraya koenigii Spreng. Experientia, 21, 390.
- 1966. (With CHAKRABORTY DP and DAS KC) Structure of Mahanimbine. Sci. & Cult., 32, 83.
- 1967. (With PAUL BD) Chemical Examination of the bark of Luvanga scandens, Ham. J. Indian Chem. Soc., 44, 659.
- 1968. (With PAUL CB) New quinoline alkaloids from Ravenia spectabilis Engl. ibid, 45, 552.
- 1959. (With Sanyal PK) Natural coumerine from leaves of Murraya paniculata (I) Jack. Scil & Cult., 35, 332.
- 1970. (With CHAKRABARTI P et al) Coumarins from Pimpinella monoica. J. Indian Chem. Soc., 47, 617.
- 1971. (With CHAKRABARTI P and SANYAL AK) A Direct conversion of chalcones to flavones. ibid, 48, 1163.
- 1973. (With CHAKRABORTI S and BARUA AK) Chemical examination of Clausena excavate. ibid, 50, 753.
- 1975. (With Sanyal PK et al) Chemical examination of the leaves of Murraya paniculata. ibid, 52, 1213.

MONOGRAPH

1963. Chemistry of Lac by PK Bose, Y Sankarnarayanan and SC Sengupta (Published by Indian Lac Research Institute).

