

Asima Chatterjee

First Woman DSc of India

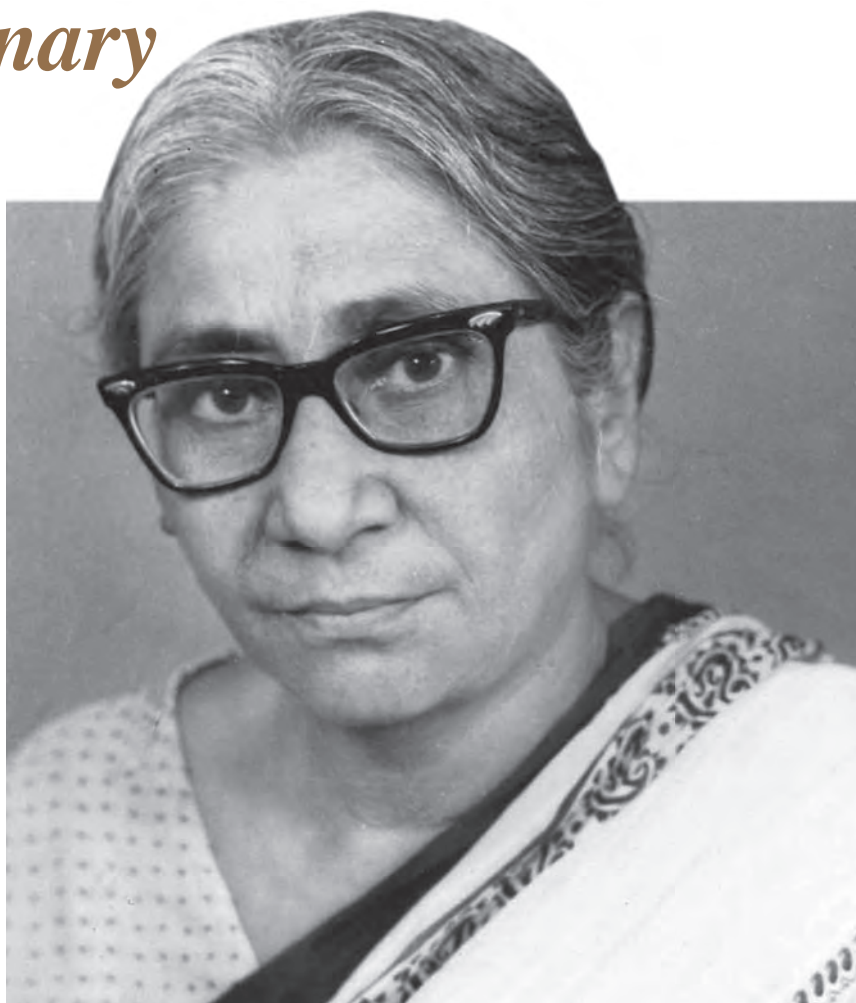
A Tribute on her Birth Centenary

DHRUBAJYOTI CHATTOPADHYAY

THERE was a time when social and cultural taboos kept away women from scientific research; it was traditionally preserved for men for a long period throughout the world. Only a few women could manage to establish themselves due to their strong will and passion for science. Asima Chatterjee was one of such woman scientist of India.

She was the first woman to be awarded the Doctorate of Science (DSc) degree by an Indian University; first woman scientist to occupy a Chair in Calcutta university, first woman General President of the Indian Science Congress and also first woman awarded the Shanti Swarup Bhatnagar award in Science. Her research career spanned over six decades. Her major interest was in the chemistry of natural products from Indian Medicinal Plants.

Born on 23 September 1917 in Kolkata, West Bengal, since her childhood Asima Chatterjee was interested in medicinal flora and the use of these medicinal plants to treat diseases. She felt the urge to introduce it in modern medical system and devoted her life to separate the chemical components of plants and other living organisms, including those of marine sources, followed by elucidation of their molecular structure, which was painstaking work at that time.



Asima was a meritorious student. After passing her Matriculation Examination in 1932 she secured the Bengal Government Scholarship. In 1934, she passed the ISC Examination from the Bethune College and again obtained the Bengal Government Scholarship. This time she also obtained two more Scholarships of the University

of Calcutta – Nawab Latiff and Father Lafnot – along with the Hemprova Bose Memorial Medal.

She eagerly wanted to get admission to chemistry honours to explore the science behind Indian traditional medicinal plants but at that time there was no such college in Kolkata where female students could study Chemistry

Honours except the Scottish Church College. But the Scottish Church was a co-education institution and being member of an orthodox, joint Hindu family, severe objections were raised by the elders to her joining the college.

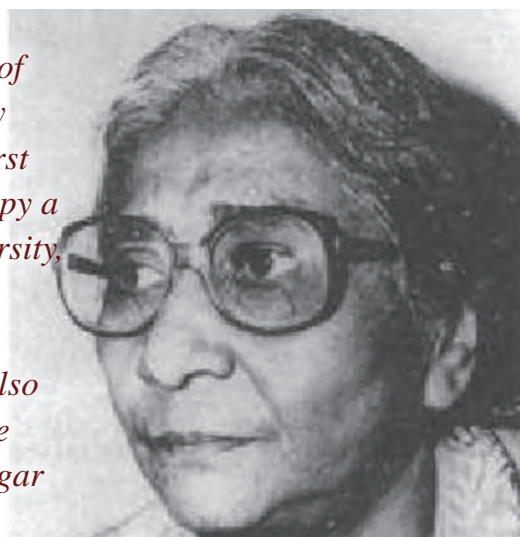
It was the courage and sheer determination of her mother that enabled Asima to get admission there. She was the only woman student out of three admitted in the Chemistry Department of Scottish Church College to complete higher education. From there she graduated with honours in chemistry in 1936 and received the Basanti Das Gold Medal.

She was now eligible to get admission in the University of Calcutta for her post graduate studies in chemistry. At that time doyens of Indian science like Acharya Prafulla Chandra Ray, Professors Prafulla Chandra Mitter, Pulin Behari Sarkar, Jagendra Chandra Bardhan and Dr Prafulla Kumar Bose, were associated with the chemistry department of this university.

Asima obtained her MSc degree in 1938 with Organic Chemistry as a special paper as first class second. She received the University of Calcutta silver medal and Jogmaya Devi Gold Medal. Now she started her research work under the guidance of Prof. Prafulla Kumar Bose, one of the pioneer natural product chemists in India. Acharya Prafulla Chandra Ray created a special fellowship for her out of his salary which he used to donate to the University of Calcutta every month. The amount was rupees seventy five at that time.

Asima devoted herself towards her research work and received the Nagarjuna Prize and one gold medal from the University of Calcutta in 1940 for the best piece of research work carried out in the Department of Chemistry. In 1940, she joined Lady Brabourne College as the Founder-Head of the Department of Chemistry. She received the Premchand Roychand Studentship in 1942, and the Mouat Gold Medal. Finally, the University of Calcutta in 1944 on the merit of her research contributions on Naturally Occurring Indole Alkaloids

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and Coumarins conferred her with DSc degree. She was the first lady to obtain the DSc degree of any Indian University. In the same year, she was appointed as Honorary Lecturer in the Department of Chemistry, University of Calcutta.

In 1945, Asima married Dr Baradananda Chatterjee, a well-known physical chemist. He was highly open minded and constantly inspired his wife. In 1946, Asima got a chance to work in USA for research work. In early 20th century it was almost impossible even to dream that a young middle class Bengali woman could pursue her interests, going alone abroad with her infant.

In USA, Asima first worked with L.M. Parks at the University of Wisconsin on naturally occurring glycosides and then with L. Zechmeister at the California Institute of Technology, Pasadena. At the California Institute of Technology her field of work was on carotenoids and pro-vitamins. In 1949, she went to the University of Zurich where she worked with the Nobel Laureate Paul Karrer on “biologically active alkaloids”. Since then alkaloids became her most favourite field of work.

A Tragic Year

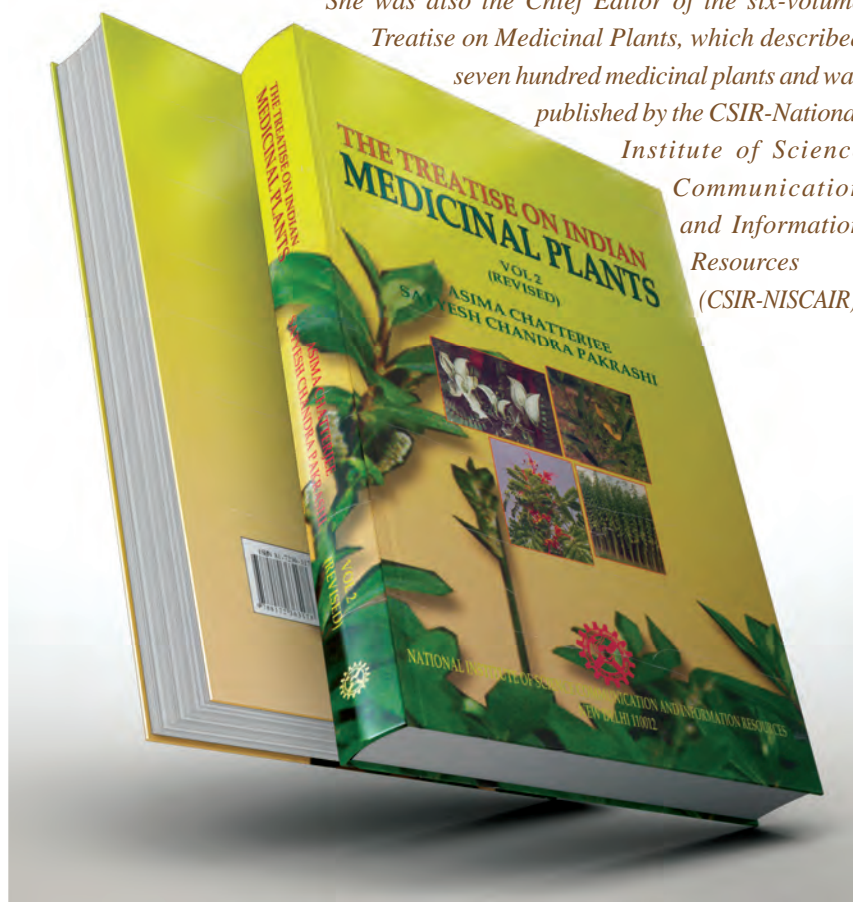
The year 1967 was a disastrous year for Professor Chatterjee. She lost her father who helped her to dream throughout his life. But more shocking was that within a period of four months she also lost her husband who was her inspiration.

Unable to bear this double tragedy, she had a massive heart attack while she was working at the University College of Science. She lingered between life and death for days together and took nearly three months to recover. But mentally she had broken down completely.

But in 1968 she bounced back. When the Bengal Chemical and Pharmaceutical Works Ltd. of Acharya P.C. Roy was involved in a historic legal battle with Hoechst Co. Ltd. over infringement of a patent right involving a Sulphonamide Derivative, Asima agreed to be the principal witness for the Indian Company on condition that she would not accept any fees. Asima’s profound knowledge of Organic Chemistry, courage and conviction helped Bengal Chemical Pharmaceutical Works Ltd. win the legal battle. In spite of her mental condition she answered hundreds of questions in Chemistry for days together in the Calcutta High Court. Had the company lost the case it would have to go into liquidation.

Asima’s Career

Asima Chatterjee did significant work on the chemistry of coumarins. Her works to isolate coumarins started with two most common herbal plants of our country. One is wood apple popularly known as Bael. Its fruits and bark are effective against gastrointestinal disorders and the bactericidal properties are attributed to the essential oils present



She was also the Chief Editor of the six-volume *Treatise on Medicinal Plants*, which described seven hundred medicinal plants and was published by the CSIR-National Institute of Science Communication and Information Resources (CSIR-NISCAIR).

and Siddha (under the Ministry of Health and Family Welfare), Government of India and sold at a relatively low price. These two combination-drugs are landmarks in developing "alternate lines of treatment" because they have no side effects.

On the request of renowned scientist Satyendra Nath Bose she wrote *Saral Madhyamik Rasayan*, a text book on chemistry for secondary schools. Another important work of Dr. Chatterjee was *Bharatiya Banashoudhi*, a six-volume treatise on Indian medicinal plants. She was also the Chief Editor of the six-volume *Treatise on Medicinal Plants*, which described seven hundred medicinal plants and was published by the CSIR-National Institute of Science Communication and Information Resources (CSIR-NISCAIR).

Dr. Asima Chatterjee was very closely associated with the Indian Science Congress throughout her life. She was the General Secretary for a term of three years and then Treasurer for a term of another three years. Eventually she was elected its General President for three years (1974-75). She became the first woman General President of this most prestigious scientific organization. One would remember her eloquent address as the General President at the 62nd Session of the Indian Science Congress in Delhi.

Asima Chatterjee's tireless efforts were awarded with the Shanti Swarup Bhatnagar Prize, Padma Bhusan and other prestigious awards.

Besides science, Asima was interested in vocal music since her childhood. She received training in classical music, Dhrupad and Khayal, for over fourteen years and stood second in the All Bengal Music Competition in 1933.

She wanted to work till the "last date of her life" and proved that till her last breath on 22 November 2006.

in it. Another one is labangalata another herbal plant used for treatment of different gastroenteritis problems.

She is best known for her research work on alkaloids. Her most important development was vinca alkaloids, now used in cancer drugs, and the development of anti-convulsive and anti-malarial drugs from plants. She had worked for over four decades on Rauwolfia alkaloids, which occupy an important position among alkaloids. She isolated Rauwolscine, a central nervous system stimulant, local anesthetic and aphrodisiac, from Rauwolfia and successfully worked out its structure. The other Rauwolfia alkaloids were reserpine and deserpidine.

Since the beginning of her teaching and research career Professor Chatterjee felt the urge to establish an Institute for carrying out research on Indian Medicinal Plants for developing new Ayurvedic formulations and medicine along with an Ayurvedic hospital for the people of West Bengal. The then

Chief Minister of West Bengal, Mr Jyoti Basu, donated her about three and half acres of land in Salt Lake City, Kolkata. The Ministry of Health and Family Welfare, Government of India sanctioned a grant of rupees 4 crores for her dream project. This unique Centre-State collaboration gave birth to a Regional Research Institute (Ayurvedic). It has now been upgraded to the Central Research Institute (Ay), working under the direct administration of the Ministry of Health and Family Welfare, Govt. of India. Professor Chatterjee served here as Honorary Principal Coordinator for many years.

The most famous work she carried out in this institution was the development of Ayush 56 (Indian Patent No. 141170 dt. 14th July 1976) used for the treatment of epilepsy, and the anti-malarial drug, coded Ayush 64, which is a combination of different parts of four herbs (Indian Patent No. 568/Del. 70, 7th August 1979). Both these were patented by the Central Council of Research in Ayurveda

Shri Dhrubajyoti Chattopadhyay is Project Coordinator, North Bengal Science Centre, P.O. Matigara, Dist. Darjeeling-734010; Email: dckc.sc@gmail.com