SCIENCE AND CULTURE

VOLUME 74 ❑ JANUARY-FEBRUARY 2008 ❑ NOS. 1–2

EDITORIAL

NATURAL PRODUCTS CHEMISTRY AROUND THE WORLD

Tribute to

Professor (Mrs.) Asima Chatterjee

I must thank 'Indian Science News Association' for inviting me to act as guest editor for the special issue of 'Science and Culture' on 'Natural Products Chemistry' dedicated to my revered teacher, Professor (Mrs.) Asima Chatterjee, D.Sc., F.N.A., who passed away on November 22, 2006. She was the former Khaira Professor of Chemistry and Honorary Director, Centre for Advanced Studies on Natural Product Chemistry, University of Calcutta for several decades. This is a great opportunity to prepare a compendium of research around the world on natural products chemistry in which Professor (Mrs.) Chatterjee was a pioneer scientist, whose work and achievements have been elaborated in an article of this issue, and obviously this the most befitting way to pay tribute to this great soul. She was also passionately associated with the activities of 'Indian Science News Association', publishing this journal for the last seventy three years. The organisation takes pride in this endeavour.

Nature is the 'master chemist', continuously synthesizing innumerable chiral specific compounds with spontaneous ease which is beyond imagination of most expert human chemists with proud possession of their intelligence and advanced scientific technologies. It is always fascinating to isolate different types of compounds from natural sources, elucidate their structure and study their chemistry in details. Synthesis of some of these compounds enriched the basic knowledge of chemistry to a great extent.

The study of natural products chemistry has become important from time immemorial for the discovery of drugs or bioactive chromophores to fight against existing and invading diseases. The isolation of the antimalarial quinine from *Cinchona officinalis,* the analgesic morphine from *Papaver somniferum,* the cardiotonic agent digoxin from the foxglove, *Digitalis purpurea* created a stir in the history of medicine. Other significant drugs developed from traditional medicinal plants include : the antihypertensive agent, reserpine from *Rauwolfia serpentina,* ephedrine from *Ephedra sinica* and muscle relaxant tubocurarine from *Chondodendron tomentosum.* The most recent additions are anticancer drugs vincristine and vincaleucoblastine from *Vinca rosea* and taxol from *Taxus brevifolia.* The calanolides, isolated from *Callophyllum lanigerum* and *C. teysmanni* showed significant anti-HIV activity. They are being chemically and pharmacologically investigated for development of specific anti-HIV drug. Besides the terrestrial sources, the scientists are now veering round towards marine flora and fauna for discovery of exciting compounds, some of which have already been tested to be promising anti-cancer and anti-aids drugs. The most prominent of these is bryostatin 1, isolated from the bryozoan, *Bugula neritina* from which, by synthetic modifications, dolastatin 10 has been prepared which is under Phase I clinical trial as antitumour agent. The magical exposition of antibiotics against different diseases is well

Professor Asima Chatterjee with Professor Paul Karrer, N.L.

known and these are also regarded as the invaluable gift of nature.

With the advent of devastating diseases such as cancer, aids, viral infections, diabetes, the research related to natural products has been intensified. The introduction of combinatorial chemistry and pharmacogenomics have added new dimensions to this topic of research. Scientists are also eager to know about the enzyme systems and biosynthetic pathways through which very complicated genus specific, chiral compounds are being synthesized.

It has been estimated that 5–15% of the approximately 2,50,000 species of higher plants have been systematically investigated for the presence of bioactive compounds, while the potential of the marine environment has barely been tapped. The Actinomycetes have been extensively investigated and remain major source of novel microbial metabolities. However, less than 1% of bacterial and less than 5% of fungal species are currently known; the potential of novel microbial sources, particularly those found in extreme environments, seems unbounded. It is evident that there is enormous scope of studying nature from chemical as well as medicinal perspective for the benefit of mankind. A bird's eye view of the work on different and facets of Natural Products Chemistry from eminent scientists of the world has been incorporated in this issue.

I have been overwhelmed by the spontaneous response of the renowned scientists all over the world whom I approached for contributing article in this issue. Professor Julie Banerji (India) has drawn a vivid biosketch of her mother Professor (Mrs.) Asima Chatterjee. Professor P. Balaram (India) has expressed his homage by depicting a view about the contemporary Indian Scientists excelling in different branches of sciences. Professor Geoffrey A. Cordell (USA) has wonderfully described the importance of research on Natural Products from health care perspective. Professor Mary J. Garson (Australia) has presented an account on the recent advances in Marine Natural Products Chemistry. Professor Shibnath Ghosal (India) has written a very interesting article on the energy transducing organic molecules in meteorites – pointing to a significant phenomenon about the emergence of life on earth. Professor Joachim Stöckigt and Dr. Leif Barleben (Germany) have expressed their homage by contributing an article on Rauwolfia alkaloid biosynthesis in which Professor Asima Chatterjee had great contribution. Dr. Biswanath Das and Dr. Ratna Das (India) have described the isolation and characterisation of novel pseudoguaianolides from plant sources. Professor Vijaya Kumar and his group (Srilanka) has described a very practical application of natural product chemistry in his well – planned article. Professor Yoshinori Asakawa (Japan) has given a comprehensive review article on Marchanitophyta (liverworts) which may be useful for future researchers for finding biologically active chemical compounds from this source. Dayar Arbain (Indonesia) started his research on Natural Products Chemistry almost from zero and had to fight for establishing a standard natural products chemistry lab in his motherland. So his article will not only provide informations on the chemistry of Sumatran plants but it will enthuse young researchers of this part of the globe to study natural products chemistry from diverse angles overcoming all difficulties.

I am very much grateful to all of them as it has been possible, due to their whole hearted cooperation, to bring out this special issue of Science and Culture as a true international memoir.

Professor Asima Chatterjee with Professor Linus Pauling, N.L.

I am also thankful to those who readily sponsored the publication of this issue as a mark of respect to Professor (Mrs.) Asima Chatterjee.

On behalf of the Indian Science News Association, contributors and readers we record our homage to Professor (Mrs.) Asima Chatterjee, D.Sc., F.N.A. for her great contribution in Natural Products Chemistry by publishing this special issue of Science and Culture. ❐

Biswapati Mukherjee
Guest Editor