Notes and News

Teaching under the Tree Canopy from Buddha, Hippocrates and Tagore from 400 BC: Connecting Threads via the Cultured Tree Saplings

earning under the open sky with an open mind and communicating with nature directly has a unique appeal. Brilliant noble and dedicated minds bubbling with ideas are tuned to mentoring the bright hungry minds of the ancient, civilized societies. A few of them were honored, while Socrates was poisoned to death with Hemlock juice for poisoning the Greek youths. Siddhartha Goutam Buddha, the Nepalese prince attained enlightenment at Bodh Gaya, Bihar, India after 49 days of meditation under the Mahabodhi Tree around 500 BC; over millennia the Mahabodhi temple with the sacred Fig tree and the bench, has been reconstructed, restored, remodeled with assistance from Burma, Thailand, Japan, Korea and Vietnam. An existing Mahabodhi Tree is often cited as the direct descendant of the original tree. This tree, planted around 250 BC, is a frequent destination for pilgrims, being the most important of the four main Buddhist pilgrimage sites.

Considering the worldwide ongoing conflicts, India could take the advantage and lead and set up a Peace Invocation Center at Bodh Gaya for resolving the war conflicts in collaboration with the United Nations Organization. We must invite the testosterone-loaded male

warmongers, Min Aung Hlaing, Myanmar, Xi Jinping, PR China, Vladimir Putin, Russia, Bashar Al-Assad, Syria for re-enlightenment in the practice of renouncement rather than the land grabbing occupation, like his former Chinese pilgrims, Fahian, Xuan Zang, Yijing, etc. visiting the Nalanda Mahavihara as the greatest center of Buddhist learning.

The Tagore tradition of his teachings on the cemented circular benches in the Visva-Bharati University, Santiniketan (1922, Bolpur, West Bengal), originated from the tradition of Gautam Buddha (500 BC) under fig tree and his contemporary mentor, Hippocrates II (Physician, Father of Medicine) teaching under the tree shade in COS island, Greece around 400 BC, Platanus Orientalis, like the current Sycamore tree.

Medical graduates, worldwide, take the Hippocratic Oath "Do no harm" during their graduation ceremony. We were delighted to visit the Greek remnants of Asclepius symbol at COS Island in 2008 during the Turkey-Greece tour, organized by the Gateway Travel. Hippocrates appeared to have traveled widely in Greece and Asia Minor practicing his art and teaching his pupils in many disciplines, e.g. epidemics, diagnosis of disease, bone fracture and wound-healing and he presumably taught at the medical school at Kos/Cos quite frequently. Although much of the thoughts and writings seem wise and correct, there are large areas where much is unknown, since he did not leave any written records.

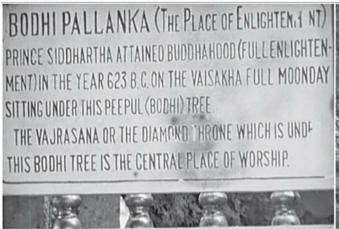




Fig. 1. Enlightenment of Buddha around 500 BC and his mentoring under the Fig tree branches (Ficus religious, Right) and the Bronze plaque (Left).

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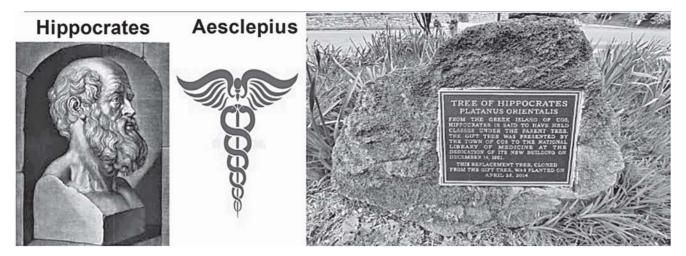


Fig. 2. Memorialize the Threads of Tradition of Teachings under the Tree canopy. Hippocrates (Left), Medical symbol Aesclepius in COS islands (Center) and the bronze plaque on a stone slab at NIH campus (Right), Bethesda, MD, USA.

As I was rushing to go to my favorite NIH Library in Building 10 via the north side entrance, I was surprised to see this unique tree at the NIH Campus and took iPhone pictures of the memorable cultured tree and the plaque installed in 2014 for you and me.

I also saw a cloned sandalwood tree in front of the Biochemistry Building, Indian Institute of Science at Bangalore, while attending the Indo American Society of Nuclear Medicine Seminar at Taj Hotel in 1984. I had a pleasant hour-long discussion with the Chairman. P.S. Sastry about our common interest in lipoprotein transport of LDL-and HDL-cholesterol in atherosclerosis.

Xuan Zang wrote that after every destruction, a new tree of the same species was planted in the same place. Maintaining the traditions, the classes are still held in the open under the shade of huge mango trees and students and tutors alike still travel by cycles to keep pollution at bay at Visva-Bharati University. The old buildings made up of mud walls and thatched roofs, are still intact and find a place within the main campus. I made a deeper connection with my beloved poet, Rabindranath Tagore, when serving at the university of Urbana-Champaign@Illinois (1996-2000), where Tagore stayed in Urbana for a few weeks and wrote many poems. Now, the current Bengali residents celebrate the Annual Tagore Day in his memory at the Unitarian Universalist Church, now a Community Center, where Guruji delivered his series of four lectures on spiritual thoughts, including The Upanishads (November 17), religions in ancient India (November 23) and Hindu thought as well as the problem of evil(November 27). During November 1913, Mr. Tagore was awarded the Nobel Prize for Literature. His son, Rathindranath Tagore received his master's degree in agriculture, where many novel agricultural methods, specifically the crop rotation for enhanced fertility at the Morrow plot and he practiced those principles as a horticulturist at Sriniketan and planted exotic plants and trees from other lands along with the skills of training in multiple handicrafts for the local residents.

During my second visit to Santiniketan, organized by Professor Sudhendu Mandal, we enjoyed the hospitality of Visva-Bharati and gave a lecture on the topic of my translational research in cardiovascular medicine (1971-2000).

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Report of Professor N.C. Datta Memorial Lecture

The Fifth Professor N.C. Datta Memorial Lecture was organised by National Environmental Science Academy (NESA), West Bengal Chapter and Indian Science News Association (ISNA) on the 28th April, 2023 at N.R. Sen Auditorium, University of Calcutta at 4.30 p.m. The programme was chaired by Professor Basudeb Barman, former Vice-Chancellor, University of Kalyani. Dr. Amit Krishna De, Chairman, NESA, W.B. Chapter and Honorary Secretary, ISNA in his welcome address dwelt on the rich contribution of Late Professor N.C. Datta as former President in shaping the NESA, W.B. Chapter activities over the years. Professor Datta was a distinguished academician in the field of Animal Biology at University

of Calcutta and also a humane person who left an indelible mark among his admirers and students with his simple and austere lifestyle. Professor Manas Chakrabarty, Honorary Secretary, ISNA, spoke on the activities of ISNA over the years and also how during the stint of Professor Datta as the Honorary Secretary, he was instrumental in increasing the membership strength of the Association by interacting with students of different colleges and institutes. He was a Vice-President of Indian Science News Association (ISNA), Kolkata from 2013 till his death. Dr. B.K. Mahapatra, Vice-President, Professor



(L to R) Dr. Amit Krishna De, Dr. Uttam Kumar Sarkar, Dr. Subhendu Bikas Patra, Prof. Basudeb Barman, Prof. Manas Chakrabarty, Dr. B.K. Mahapatra and Prof. Prabir Kumar Saha

N.C. Datta Memorial Committee and former Principal Scientist (Fisheries), ICAR-CIFA, Kolkata and a former student of Professor Datta introduced the speaker for the memorial lecture. Dr. Uttam Kumar Sarkar, Director, ICAR-National Bureau of Fish Genetic Resources (NBFGR), Lucknow. Dr. Sarkar did his Ph.D. in Fisheries Biology from University of Kalyani. He is a leading scientist of the country with significant contribution in fish conservation biology, breeding of endangered species, aquatic habitat modelling, climate-resilient inland fisheries, cage culture technologies, reservoir and wetplan fisheries etc. He has published over 230 research papers in peer-reviewed journals with over 4200 citations and supervised 12 Ph.D. students. Dr. Sarkar in his presentation spoke on the first of its kind Aquatic Genetic Resources Information System (AqGRIS) online database developed by ICAR-NBFGR which documented 3187 native fishes belonging to 248 families and 48 orders in our country. He talked about the in-situ conservation in protected areas like biodiversity hotspots, national parks and ranching for commercially important fish species and ex-situ through cryopreservation of fish sperms for development of desirable gene pools. He also highlighted on Conservation Aquaculture through Co-management participatory measures involving local community for conservation. The use of Molecular biology and genomics as a tool for conservation through development of a genomics resource portal FisOmics at ICAR-NBFGR was presented. He reminded the audience on the threats to AqGR from nonresponsible aquaculture practices like overfishing of wild stocks for brooders and as feed fish, disease outbreak through improper water

management, high stock density etc. and anthropogenic activities in the form of damming of rivers and agriculture run off. Another significant achievement in the form of National Repository of World's largest collection of fish cell lines in our country was also mentioned in his presentation. The Novel concept of State fish where 17 states declaring 15 species as State fish was also shared with the audience. Professor Basudeb Barman in his speech appreciated Dr. Uttam Kumar Sarkar for presenting an exhaustive overview of the invaluable work done covering fish resource conservation in our country and the development of Climate Smart / Resilient Freshwater Fish species. He also presented a memento to the speaker on the occasion. Professor Prabir Kumar Saha, Honorary Treasurer, ISNA presented the customary vote of thanks. The entire programme was anchored by Dr. Subhendu Bikas Patra, Convenor, NESA, W.B. Chapter.

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Observation of World Health Day

Keeping in mind the present scenario, student health is one of the most relevant issues. On the occasion of World Health Day, Professor J.J. Ghosh Foundation jointly with Birla Industrial and Technological Museum (BITM) organised a programme on 6th April, 2023 with lecture of renowned consultant Physiatrist-cum-Neuro Orthopedic and Rheumatological Rehabilitationist Dr. Mouli

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Madhab Ghatak at the seminar room of Birla Institute of Technological Museum, Kolkata.

The program started with welcome address by Prof. Mrinal Kanti Poddar, eminent biochemist and President of the Foundation. In his speech he highlighted the life and works of Prof. Jagat Jiban Ghosh. Dr. Amit Krishna De, member, Executive Committee of the Foundation, and Honorary Secretary, Indian Science News Association introduced Dr. Ghatak and then he started his lecture. Highlighted part of the lecture was different health issues affecting student life. He began his talk with an example of somatisation syndrome from his professional life. Lack of physical activities and excessive use of mobile phones make a teenager mentally and physically unfit. Thus they become vulnerable to diseases and addictions. These have a direct impact on their concentration and confidence levels. Problems must be handled carefully with proper awareness, proper diet and exercises. In this context Dr.Ghatak quoted the famous saying of Swamiji which states playing football instead of reading Geeta will bring students closer to heaven. He mentioned about RICE method of treating injuries which includes Rest, Ice, Compression, and Elevation. The speech concluded with a discussion on achieving good health through some health precautions. Most of the students today find themselves into the rat race of getting marks. Availability of uncontrolled internet have made some of them puppets to social media, online games, etc. This has deprived them of enjoying nature and is harmful for their health in the long run. Prof. J.J. Ghosh Foundation selected world health day as the best occasion to speak on this issue. World health depends on students health as energetic minds shape the future. It is also the parent's duty to provide an atmosphere for these buds to expand their petals.

An open house quiz was also organised to celebrate the 75 year's of WHO. Ms. Aditi Ghosh, Education Officer of BITM anchored the event and executed it quite well. The program was a good stuff to nurture inquisitive minds. It was a pleasant trip down memory lane to see enthusiastic students answering. Students were delighted to take their prizes and the program ended with that. 117 students and 18 teachers from 8 schools - Nabajatak Vidyabhavan for Girls, Techno India Group Academy, Salt Lake Point School, Shri Shikshayatan School, Birla High School, Techno India Group Public School Garia, Delhi Public School Ruby Park and Calcutta Emmanuel School attended the session.

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A low-cost COVID-19 vaccine developed by researchers at Stanford Medicine

In a study led by Stanford Medicine Researchers (published in Nature Communications 14: 2149, 17thApril, 2023), a low-cost protein-based COVID-19 vaccine that does not require refrigeration, provided immunity in rhesus monkeys for one year.

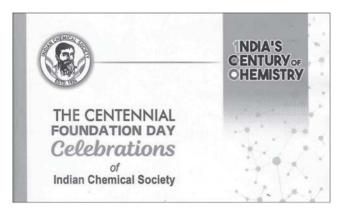
Though the rapid development of COVID-19 vaccines has been a scientific triumph, the need remains for a globally available vaccine that provides longer-lasting immunity against present and future SARS-CoV-2 variants of concern (VOCs). The new vaccine, called Delta-C70-Ferritin-HexaPro ((DCFHP-alum), a ferritin-based, proteinnanoparticle vaccine, formulated with aluminum hydroxide (alum) as the sole adjuvant, stimulates a stronger immune response against known and new variants. DCFHP-alum can be distributed at low cost because it can be produced in large quantities. Adjuvant alum is inexpensive and, safe for infants. Researchers hope, unlike the bivalent Pfizer/ BioNTech and Moderna mRNA vaccines, DCFHP-alum, can remain unrefrigerated for up to two weeks and will help alleviate the need for boosters while improving herd immunity around the world. Although the vaccine yet to go through human trials, it could be an alternative to the mRNA vaccines widely used for COVID-19.

While developing this vaccine, scientists made several changes to the spikes found on the surface of the coronavirus. They first stabilized the spikes on the surface of the virus which grabs proteins on our cells. Once the proteins attach to the spikes, the spikes turn inside-out to fuse with our cells. By modifying the spikes to make them more rigid so that they're not able to turn inside-out, vaccines can prevent this tampering. Secondly, they fused ferritin, a nanoparticle which, in addition to stabilizing the spike proteins, is a better stimulant of the immune system, partly because the nanoparticles are captured by dendritic cells. Next, they deleted the last 70 amino acids (the region described as "a distraction for the immune system"), the building blocks of proteins, of the spike closest to the membrane of the virus. People make a strong antibody response against this region, but the antibodies produced do not neutralize the virus. By removing that part of the protein, the scientists' hypothesis was that the vaccine would stimulate the immune system to make more antibodies that neutralize the virus.

Once the vaccine was developed, the team immunized two groups of rhesus monkeys, one received a booster 21 days later and the other 92 days later. Both showed resistance against the virus which lasted at least 250 days. The booster given after 92 days elicited a more robust immune response than the one given after 21 days. A second booster on day 381 had a significant immune response demonstrating immune system memory.

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Centennial Foundation day Celebration of Indian Chemical Society



Coundation of Indian Chemical Society and its Development. The Indian Science Congress Association was established in 1914, owing its origin to British Chemists Professor J.L. Simonsen and Professor P.S. MacMohan. They felt that scientific research in India would be stimulated if an Annual meeting of research scientists somewhat on the lines of the British Association for the Advancement of Science could be arranged. The first Session was organised in January 1914 at the premises of the Asiatic Society with Sir Asutosh Mookerjee as General President. The 35 papers presented were divided into six sections, viz. Chemistry, Physics, Zoology, Botany, Geology and Ethnography under six Sectional Presidents. So far as scientific workers in Chemistry were concerned, this was the only all-India platform in which they could present their work.

The first two ISCA Sectional Presidents in Chemistry were P.S. Macmohan and P.C. Ray. Several of the leading chemists in India, mostly active in the ISCA, felt the need for an exclusive all-India Society for Chemists, which would arrange its own conferences and also bring out its own Journal. This was to be on the lines of the Chemical Society, UK. The initial planning was done and the

groundwork laid by J.C. Ghosh, J.N. Mukherjee and S.S. Bhatnagar, who were carrying out research at the University College, London UK. The Indian Chemical Society was founded on 9th May 1924. P.C. Ray was its first President with J.N. Mukherjee as Secretary, and N.R. Dhar and A.N. Meldrum as Editors of the journal. Several leading chemists involved with ISCA were among its founders. For several decades, among the major functionaries who over the years served the Indian Chemical Society as President and Secretary, and also served the ISCA as Sectional President in Chemistry were - in addition to Acharya P.C. Ray (President, ICS 1924-26, 1929-30; General President, ISCA, 1920), Gilbert John Fowler, Baba Kartar Singh, Nil Ratan Dhar, Jnan Chandra Ghosh, Biman Behari Dey, Hemendra Kumar Sen, Biresh Chandra Guha, Swanti Swarup. Bhatnagar, Jnanendra Nath Mukherjee, Priyadaranjan Ray, Prafulla Kumar Bose, Mata Prasad, Krishnaswami Venkataraman, Ramanlal Chhaganlal Shah, Ranchodji Dadabhai Desai, Debi Prasad Chakraborty, Hira Lal Nigam, Avijit Banerji, Girjesh Govil, Krishna Kamini Rohatgi-Mukherjee. Coming to the present, two recent Office-bearers of ISCA R.K. Verma and Sheo Satya Prakash had earlier served the ICS in different capacities.

Through a generous grant from Acharya P.C. Ray and the active support of the Calcutta University Vice-Chancellor Sir Asutosh Mukherjee, rooms were constructed in the second floor of the Tarak Nath Palit Building of the University College of Science premises at Upper Circular Road (now Sir Rashbehari Ghosh Siksha prangan, 92 Acharya Prafulla Chandra Road) to house the office of the Indian Chemical Society. The office of the Society still operates from these rooms.

The first AGM of the ICS was held at Hindu University, Banaras, at which Acharya P.C. Ray delivered the Inaugural Address entitled 'Chemical Knowledge of the Hindus of Old'. The Journal of the Indian Chemical Society was brought out in November 1924, initially as a quarterly, with a generous grant from Calcutta University. Subsequently it became a monthly from 1930. For several years from the mid-1930s to the early 1970s, the Society published the Indian Journal of Applied Chemistry. The Journal of the Indian Chemical Society is being published from 2021 by Elsevier. The Indian Chemical Society also currently publishes the periodical 'Education in Chemical Science and Technology'.

The first Annual Convention of Chemists was held by the Indian Chemical Society in 1963, previous Annual meetings being mostly held along with sessions of ISCA. The Indian Chemical Society observed its significant milestones with International Conferences at Calcutta: Silver

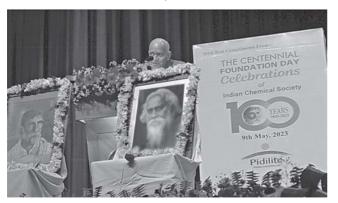
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His Excellency Hon'ble Governor of West Bengal Dr. C.V. Ananda Bose with Professor Ramesh Chandra and Dr. R.A. Mashelkar on the dais.

Jubilee - 1948 (President - Professor Priyadaranjan Ray), Golden Jubilee - 1973 (President - Dr. R.N. Chakravarti), Diamond Jubilee - 1984 (President - Professor K.K. Rohatgi-Mukherjee), Platinum Jubilee - 1999, Calcutta (President - Dr. J.P. Mittal). The Indian Chemical Society was a founding member of the Federation of the Asian Chemical Societies in the late 1970s, and played an important role the organisation with Professor R.C. Mehrotra, Professor D.P. Chakraborty, Professor S.K. Talapatra and Professor Avijit Banerji involved in its activities till the mid-1990s. Recently, Professor D.C. Mukherjee has revived the participation of ICS in FACS after about two decades.

Indian Chemical Society and Indian Science News Association. Several stalwarts of the Indian Chemical Society were involved in the foundation of ISNA, and in nurturing it through the years. Acharya P.C. Ray and Professor Meghnad Saha founded ISNA in 1935. Acharya Ray was the first President of ISNA. Distinguished personalities associated with the Indian Chemical Society like Professor J.C. Ghosh, Professor B.C. Guha and



Professor M. M. Sharma delivering his address

Professor (Mrs.) Asima Chatterjee were involved in the growth and functioning of ISNA. In recent years, Professor S.K. Talapatra and Professor Manas Chakrabarty and Professor (Mrs.) Julie Banerji – who served the ICS in different capacities – being present office-bearers of ISNA.

Centennial Function of Indian Chemical Society. The centenary year of the Indian Chemical Society is being held over one year, commencing with the Centennial Function of Indian Chemical Society held on 9th May 2023, Ramakrishna Mission Institute of Culture, Golpark, Kolkata. 9th May also marks of Birth Anniversary of Rabindranath Tagore.

The President of the Society Professor G.D. Yadav - National Science Chair (SERB/DST), Emeritus Professor of Eminence and former Vice-Chancellor, ICT, Mumbai - welcomed the participants to the start of the Centenary celebrations of the Indian Chemical Society. Swami Sampurnandaji Maharaj, President of the Ramakrishna Institute of Culture, inaugurated the Proceedings with a short thought-provoking address. His Excellency Hon'ble Governor of West Bengal Dr. C. V. Ananda Bose then delivered his address. He spoke in his inimitable style, punctuating his speech with relevant anecdotes, and emphasised the importance of scientific research, particularly Chemistry, in the development of our nation. He hailed the Indian Chemical society in its Centennial year.

The Centenary awards of the Society were then presented by his Excellency the Governor:

Professor M.M. Sharma, FRS, Emeritus Professor of Eminence, ICT, Mumbai – 'Clean Science & Technology Professor C.N.R. Rao ICS Centennial Jubilee Award for Leadership of Chemical Sciences and Engineering'.

Dr. R.A. Mashelkar, FRS, National Research Professor, former Secretary, DSIR and former Director-General, CSIR – 'Pidilite Industries Professor M.M. Sharma ICS Centennial Jubilee Award for Leadership of Applied Sciences and Chemical Industry'.

Dr. J.D. Yadav, Pro-Vost, Indrashil University, Mumbai and former Director CSIR-IICT, Hyderabad – 'Dr. A.V. Ramarao ICS Centennial Jubilee Award for Innovation in Industrial Research'.

Dr. Swaminathan Sivaram, Honorary Professor Emeritus and INSA Emeritus scientist, IISER, Pune and former Director CSIR-NCL, Pune – 'Aether Industries Dr. R.A. Mashelkar ICS Centennial Jubilee Award for Research, Innovation and Technology Development'.

Professor Goverdhan Mehta, FRS, K. Anji Reddy chair at Dr. Reddy's Institute of Life Sciences and former Vice-Chancellor - University of Hyderabad, former Director - IISc, Bangalore – who was awarded the 'Oriental Aromatics Dr. Sukh Dev ICS Centennial Jubilee Award for the most outstanding organic chemist and thought leader' could not attend the function.

The Governor felicitated former office-bearers of the Indian Chemical Society – former Presidents Professor Ramesh Chandra and Professor D.C. Mukherjee, and former Honorary Secretary Professor Avijit Baneriji.

The brochure entitled 'India's Century of Chemistry' brought out on this occasion by the Indian Chemical Society was released.

Guest of Honour Dr. R.A. Mashelkar delivered his lecture 'Science, Innovation and Serendipity' citing several examples of the role of Serendipity in scientific discovery, including examples from his own researches in polymer chemistry. He emphasised that Indian chemists should not merely follow the lead of those from other countries, but lead in developing innovative areas of research.

The Chief Guest Professor M.M. Sharma, the doctoral mentor of both Dr. R.A. Mashelkar and Professor G.D. Yadav, gave a fascinating talk on 'Wonders of Chemistry', emphasising the central role of Chemistry in science

research and development. He said that life is not possible without Chemistry, but there is better life possible with Chemistry. Chemistry is in everything and everywhere. Chemistry is a central science - Chemistry is interdisciplinary and an enabling science.

Award lectures were given by Professor Goverdhan Mehta (online mode) on 'Chemistry a Central Science for the Sustainability of the People and the Planet', Professor J.D. Yadav on 'Excitement in Natural Products Synthesis' and Dr. Swaminathan Sivaram on 'Functional Polymers for Energy Applications: Structure, Property and Functions'.

At the end of the Inaugural function, the vote of thanks was moved by Professor D.C. Mukherjee in a voice charged with emotion reflecting the emotions and aspirations of the members of the Society.

The meeting was well attended, with the presence of several dignitaries. An encouraging feature was the presence of a large number of college students.

The ICS envisages a year-long centennial programme, with a three-day Conference in Delhi on 2-4 August to observe the birth anniversary of Acharya P.C. Ray, and the Annual Convention of Chemists in December 2023 at Mumbai, as the highlights.

Avijit Banerji,
Former Honorary Secretary and
Former Vice-President, Indian Chemical Society;
Former General Secretary and
Sectional President of Chemistry,
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Attention! All readers of Science and Culture

The journal *Science and Culture* has been listed now in the UGC approved list of journals on the following subjects: **Archaeology, Biochemistry, Genetics and Molecular Biology (all), Biotechnology, Cultural Studies Environmental Science (all), Palaeontology, Social Sciences (all).** One may visit the following UGC website for further details: http://www.ugc.ac.in/journals for further information.



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