SCIENCE AND CULTURE

MARCH-APRIL 2018/VOLUME 84/NO. 3-4

A JOURNAL OF NATURAL AND CULTURAL SCIENCES

	D DV THE	50/700/11		
PUBLISHED BY THE		EDITORIAL		
INDIAN SCIENCE		GM Crops: A Source of Adversity or Prosperity?		
NEWS ASS	JCIATION	- S. C. Roy		87
EDITORIA	LBOARD			
Professor S. C. Roy Editor-in-Chief		LETTERS TO THE EDITOR		90
Shri Biman Basu		ARTICLE		
Dr. Satyabrata Chakrabarti		ARTICLE Three Decades of Experience with Genetically Engineered Crops: Way Forward in the Indian Context — P. C. Kesavan and M. S. Swaminathan 92		
Professor Syamal Chakrabarti				
Professor Manas Chakrabarty				
Professor Barun Kumar Chatterjee				92
Dr. Amit Krishna De		Voyager Mission and Voice of Indian		
Professor Sudhendu Mandal		Classical Music — Achintya Pal		99
Dr. K. Muraleedharan		— Achimiya Fai		77
COLLABO S. Aditya (Kolkata) Amiya Kumar Bagchi		Netaji Subhas Chandra Bose, Bidhu Bhushan Ray and "Science and Culture" – History of Science vs. Political History — Rajinder Singh	•••	103
(Kolkata) D. Balasubramanian (Hyderabad)	A. K. Hati (Kolkata) Mridul Hazarika (Guwahati)	Marketing of Science for Public Understanding — Hem Shanker Ray		110
Indrani Bose (Kolkata) S Chandrasekhar (Hyderabad)	S. Kailas (<i>Mumbai</i>) Punam Kakkar (<i>Lucknow</i>)	Mach, Boltzmann and Atomism — Narendra Dutt Sharma		117
D. P. Chattopadhyaya (Kolkata) Samit Chattopadhyaya (Kolkata)	Abhijit Lahiri (<i>Delhi</i>) A. N. Lahiri Majumder (<i>Kolkata</i>) B. K. Pattnaik (<i>Kanpur</i>)	OPINION Needed – More Science and Less Religion — Vasant Natarajan		122
Mihir Kanti Choudhuri (<i>Tejpur</i>) Mrinal K. Dewanjee	V. Ravichandran (<i>Kolkata</i>) Ashoke Sen (<i>Allahabad</i>) Rajinder Singh(<i>Germany</i>)	A TRAVELLER'S JOURNAL		
(U.S.A.) R. Gadagkar (Bangalore)	Srinivasan Srikanthan (Chennai)	A Russian Experience – Moscow as a Traveller — Antonia Hoogewerf		123

Contd. next page.



Indian Science News Association

President

Dr. K. Muraleedharan

Vice-Presidents

Professor M. S. Swaminathan Professor S. K. Talapatra Professor Sibaji Raha Professor Sanghamitra Bandyopadhyay

Honorary Secretary Professor Sudhendu Mandal

Honorary Treasurer

Professor Amalendu Bandyopadhyay

Council Members

Professor (Mrs.) Julie Banerji Professor Bikas K. Chakrabarti Dr. Manoj Kumar Chakrabarti Dr. Satyabrata Chakrabarti Professor Manas Chakrabarty Professor Dhrubajyoti Chattopadhyay Professor Basab Chaudhuri Dr. Manas Pratim Das Dr. Sisir Kumar Majumdar Dr. Balaram Majumder Dr. Hemanta Kumar Majumder Professor Partha P. Majumder Professor Biswapati Mukherjee Professor Devdatta Sinha Dr. D. K. Srivastava Professor (Mrs.) Bani Talapatra

RESEARCH COMMUNICATION Fish Farming in Extended Fields at Moyna, Dist, Purba Medinipur, West Bengal - Subrato Ghosh 126 ... An Algorithm for Digital Authentication of Buddha Painting on Thangka — Gopa Bhaumik, Shefalika Ghosh Samaddar and Arun Baran Samaddar 129 **BOOK REVIEW** Nature's Third Cycle - A Story of Sunspots — Syamal Chakrabarti 134 NOTES AND NEWS 137 OBITUARY Professor Parimal Chandra Sen — Debjeet Sen 150 Professor Naresh Chandra Datta — Subrato Ghosh 152

Members of the Editorial Board are also members of the Council **Cover :** The ongoing dynamics of thrombus formation and embolization was observed on control and heparin-bonded polyurethane catheter in a canine model (See supplement)

Members of the Advisory Committee of Indian Science News Association

Professor Padmanabham Balaram	Bangalore		
Professor D. Balasubramanian	Hyderabad		
Professor Basudeb Barman	Kolkata		
Professor A. K. Barua	Kolkata		
Professor Ashok Nath Basu	Kolkata		
Dr. M. K. Bhan	New Delhi		
Professor Samir Kumar Brahmachari	New Delhi		
Professor Chandrashekhar Chakraborty	Kolkata		
Dr. Purnendu Chatterjee	Kolkata		
Professor Suranjan Das	Kolkata		
Professor Asis Datta	New Delhi		
Professor P. N. Ghosh	Kolkata		
Dr. N. K. Ganguly	New Delhi		
Dr. H. K. Gupta	Hyderabad		
Dr. K. Kasturirangan	Bangalore		
Dr. R. A. Mashelkar	New Delhi		
Professor Goverdhan Mehta	Hyderabad		
Dr. T. Ramasami	New Delhi		
Dr. Anuj Sinha	New Delhi		
Dr. Bikash Chandra Sinha	Kolkata		

SCIENCE & CULTURE ADVERTISEMENT

KAIE				
	Single Insertion			
	(Full Page)	(Half Page)		
COVER (Back)	Rs. 20,000/-	×		
COVER (Front Inside)	Rs. 15,000/-	×		
COVER (Back Inside)	Rs. 15,000/-	×		
OTHER PAGES	Rs. 10,000/-	×		
N.B. : For colour or any other special types of advertisement—rates may be negotiated.				

A discount of 20% for insertions in all issues in a year and of 15% for atleast three insertions will be allowed.

TO OUR READERS

Your appreciation of the journal makes us bold to suppose that some of your friends would also like to read SCIENCE & CULTURE, the premier scientific bi-monthly of India devoted to the publication of the progress in pure and applied sciences. The Indian Science News Association has been conducting the journal for 83 years with the editorial co-operation of eminent scientists of India with the object of promoting and diffusing knowledge laying special stress on the progress of scientific studies here and abroad, and advocating methodical application of science to problems of national regeneration.

Editorial correspondence should be sent to the Editor-in-Chief, *Science and Culture*, 92, Acharya Prafulla Chandra Road, Kolkata : 700 009. Manuscripts prepared in accordance with the Instruction to Contributors should be submitted in **Triplicate** and will not be returned unless accompanied with return postage.

Correspondence relating to subscription, advertisement and other matters should be addressed to the **Hony. Secretary, Indian Science News Association, 92, Acharya Prafulla Chandra Road, Kolkata : 700 009, Phone : 2350-2224. E-mail : scie2224@dataone.in, Website : www.scienceandculture-isna.org**

MEMBERSHIP FEE

Life Member (India)	Rs.5,0	00.00*+
Life Member (Foreign)	\$	600.00
Ordinary Member (without journal)	Rs.	100.00
Ordinary Member (with journal)	Rs.	500.00

ANNUAL SUBSCRIPTION

Inland (Institution)	Rs. 2,500.00
Foreign	U.S.\$ 125.00
Inland (Individual)	Rs. 400.00
Foreign (Individual)	US.\$ 60.00
Single Copy (Inland)	Rs. 80.00
Single Copy (Foreign)	\$ 20.00

* Entitles to receive Science and Culture for 15 years + Rs. 1000/- towards the cost of delivery of the journal for 5 years

Past Special Issues

- Glass and Ceramic Research in India (May-June 2005)
- Water Resources in South Asia : An Assessment of Climate Change Associated Vulnerabilities and Coping Mechanisms (July-August 2005)
- Unconventional Applications of Physics (March-April 2007)
- Current Trends in Leishmania Research (May-June 2007)
- Forensic Science in Criminal Justice Delivery System (November-December 2007)
- Natural Products Chemistry (January-February 2008)
- Mysteries of the Earth's Interior (May-June 2008)
- Radio Science (September-October 2008)
- Scientific Legacy of Acharya J. C. Bose The Doyen of Indian Science (November-December 2008)
- Origin of Species–A Revolutionary Argument (March-April 2009)
- Geomagnetism and Aeronomy (July-August 2009)
- Cholera : A Disease that Eludes Technological Advance (May-June 2010)
- Fifteen years of Econophysics Research (September-October 2010)
- Emerging Trends in Genomics : Applications in Health and Disease (January-February 2011)
- **Recent Trends in Tea Research** (September-October 2011)
- Impact of CSIR-NEIST in the North East Region (November-December 2011)
- New Science of Synthetic and Systems Biology (March-April 2012)
- A Journey from Plant Physiology to Plant Biology (May-June 2012)
- CSIR-CSIO : Instrumental in Scientific-eco System Measurements (September-October 2012)
- **CSIR-NML on the March** (November-December 2012)
- Atomic Energy in National Development (January-February 2013)
- Communicating Science Through Science Museums, Science Centres and Planetaria towards Developing a Culture of Science (November-December 2013)
- Nuclear Chemistry Research : Past, Present and Future (September-October 2015)
- International Year of Light 2015 (November-December 2015)
- J. C. Bose, Bose Institute and Scientific Legacy (November-December 2017)
- Cooperative Learning and Social Games : Kolkata Restaurant Problems (January-February 2018)