

Einstein's brain

The note 'Brain of the genius – Albert Einstein' by Ghosh and Parida¹ is interesting. In this regard I would like to add that Thomas Harvey, who carried out the autopsy clandestinely removed Einstein's brain before cremation and no one knew about it. As recorded by Walter Isaacson in the biography *Einstein: His Life and Universe*, this came to light in the most unexpected way. A teacher in an Elementary school in Princeton announced that Einstein died the previous day and according to his wish, he has been cremated and his body has been reduced to ashes, when suddenly a pupil in the class

responded 'my father has his brain'! That pupil happened to be the son of Harvey. When Harvey was confronted with this information, he was asked to return the brain. He refused and absconded with the brain and was chased by the authorities for years. The details of the chase read like something out of a spy novel. During this chase, Harvey cut pieces of the brain to supply to a few laboratories. Ultimately he gave up and returned the brain to the Princeton Hospital. It is a matter of providence that when attempts were made to examine the DNA, it turned out that fixation in formalin was

not suitable for DNA analysis. In a way this was providence and Einstein's wish was vindicated. I thought this part of the story as described by Isaacson, may interest the esteemed readers.

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1. Ghosh, D. and Parida, P., *Curr. Sci.*, 2015, **108**(10), 1787–1788.
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Genome editing of human embryo – a question on editorial outlook and responsibilities

In April 2015, the editing of the genome of human embryo with the help of CRISPR/Cas9 by Chinese scientists¹ has generated a worldwide debate for its unpredictable effects on humans in the times to come. Though editing human germ line genes can be of advantage to curb serious genetic disorders², it poses a possible threat to the human society for the fear of the unknown³.

The role of journals and editors is vital in publishing papers dealing with such sensitive issues for the wider dissemination of its pros and cons. The paper¹ was initially submitted to *Nature* and *Science* and was rejected by both these journals on the basis of ethical considerations⁴, only to be subsequently published in an on-line journal *Protein & Cell*. A glaring fact is that this paper with serious ethical concerns and scientific implications was accepted by the on-line journal within a

couple of days. The paper was submitted to the journal on 30 March 2015 and was accepted on 1 April 2015. It is likely that the paper was not exposed to peer-review system and was accepted at the editorial level. The fact that germ line editing has already been banned in many countries could at least have been considered by the editorial board before going for a hasty decision. Though editorial outlook may vary from case to case, it is advisable that the editorial teams work on the issues of scientific utility and ethical concerns of any research in detail before arriving at a decision on submitted manuscripts.

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 2. Lanphier, E., Urnov, F., Haecker, S. E., Werner, M. and Smolenski, J., *Nature*, 2015, **519**, 410–411.

3. Krishnan, K., Kanchan, T. and Singh, B., *Sci. Eng. Ethics*, 2015; doi:10.1007/s11948-015-9675-8; <http://link.springer.com/article/10.1007/s11948-015-9675-8>
 4. Cyranoski, D. and Reardon, S., *Nature*, 22 April 2015; <http://www.nature.com/news/chinese-scientists-genetically-modify-human-embryos-1.17378>
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Shanti Swarup Bhatnagar Prize: an inspiration for international recognitions – II

The Shanti Swarup Bhatnagar (SSB) Prize, instituted in 1957, is recognized as the most coveted prize in science and technology (S&T) in India and its recipients are popularly addressed as 'Bhatna-

gar laureates'. Over the years, the SSB awardees have been conferred with national and international recognitions, including fellowships of learned academies and societies. The year 2015 is

unique in that out of 21 foreign associates elected to the US National Academy of Sciences (NAS), from 15 countries, 2 of them are from India and both are SSB awardees.

CORRESPONDENCE

Table 1. US National Academy of Sciences foreign associates elected from India

Name and current affiliation	Year of Bhatnagar Prize	Year of election to US NAS	Year of election to FRS	Research area
Manindra Agrawal Professor, Department of Computer Science and Engineering, Indian Institute of Technology, Kanpur	2003	2015	–	Complexity theory and computational number theory
Satyajit Mayor Director, National Centre for Biological Sciences, Bengaluru	2003	2015	–	Cell biology, biophysics and biochemistry
K. VijayRaghavan Secretary, Department of Biotechnology, New Delhi	1998	2014	2012	Cellular and developmental biology
Conjeeveram S. Seshadri Director-Emeritus, Chennai Mathematical Institute, Chennai	1972	2010	1988	Algebraic geometry and algebraic groups
Raghavendra Gadagkar INSA S. N. Bose Research Professor, J. C. Bose National Fellow, Centre for Ecological Sciences, Indian Institute of Science, Bengaluru and President, INSA New Delhi	1993	2006	–	Evolution of social life in insects, insect biodiversity, mathematical modelling in genetics and developmental biology
Raghunath A. Mashelkar National Research Professor, CSIR National Chemical Laboratory, Pune and President, Global Research Alliance	1982	2005	1998	Chemical engineering
Obaid Siddiqi*	1975	2003	1984	Molecular and behavioural genetics
G. Balakrish Nair Executive Director, Translational Health Science and Technology Institute, Faridabad	1998	2002	–	Clinical microbiology, molecular epidemiology and diarrhoeal diseases
Roddam Narasimha DST Year-of-Science Professor, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru	1974	2000	1992	Aerospace engineering and fluid mechanics
V. Radhakrishnan*	–	1996	–	Astronomy, astrophysics and aeronautics
C. R. Rao [#] Distinguished Professor Emeritus, C. R. Rao Advanced Institute, Hyderabad	1959	1995	1967	Mathematical sciences
Madhav Gadgil A-18, Spring Flowers, Panchvati, Pashan, Pune	1986	1991	–	Ecology, ecological history and environmental management
C. N. R. Rao National Research Professor, JNCASR, Bengaluru	1968	1990	1982	Solid state and materials chemistry, structural chemistry
M. S. Swaminathan Emeritus Chairman and Chief Mentor, M. S. Swaminathan Research Foundation, Chennai	1961	1977	1973	Genetics, cytogenetics and plant breeding
V. Ramalingaswami*	1965	1973	1986	Animal, nutritional and applied microbial sciences

[#]Elected as member.

*Deceased.

NAS, established in 1863, is a society of distinguished scholars. Its membership is a widely accepted mark of excellence in science and is considered one of the highest recognitions that a scientist can receive. Presently, there are 2250 NAS

members and 452 foreign associates, of which nearly 200 have received Nobel prizes¹. The elected members must be US citizens, whereas foreign associates with citizenship outside the US are recognized for their distinguished and

continuing achievements in original research¹. Out of 452 scientists recognized by NAS as foreign associates, till date, 14 are from India. It is heartening to note that all these luminaries from India, except V. Radhakrishnan, are recipients

of the Bhatnagar Prize (Table 1). Eight of these scientists have also been elected to the Fellowship of the Royal Society of London. C. R. Rao, a recipient of Bhatnagar Prize in 1959, was elected to NAS as a member in 1995. Rao, a naturalized American citizen, worked for 40 years in India and then moved to USA after his superannuation from the Indian Statistical Institute². He was elected as Fellow of the Royal Society (FRS), London in 1967 and was awarded the 2001 National Medal of Science by the President of the United States³. Our previous study on 39 FRS of Indian origin, since the inception of Bhatnagar Prize till 2014, indicated that majority (23) of them are Bhatnagar awardees⁴. Another recipient of the Bhatnagar Prize, Ajay Kumar Sood of Indian Institute of Science, Bengaluru

has recently been elected as FRS in the year 2015.

The World Academy of Sciences (TWAS) was founded in 1983 in Trieste, Italy with an objective to promote scientific capacity and excellence in the South. TWAS currently has 1116 members from 90 countries, 73 of which are from developing countries^{5,6}. Till 2014, Academy membership consists of 211 scientists as fellows representing India, out of which more than 50% (112) are the recipients of the Bhatnagar Prize.

It is worthy of mention that 96% of the SSB awardees till date (503) preferred to contribute to Indian S&T, in spite of the lucrative opportunities to work abroad, and have brought recognition to the country through world-class science.

1. www.nasonline.org
2. Prakasa Rao, B. L. S., *Curr. Sci.*, 2014, **107**(5), 895–901.
3. www.nsf.gov (accessed on 15 June 2015).
4. Singh, I. and Luthra, R., *Curr. Sci.*, 2014, **107**(2), 163–166.
5. TWAS Regional Office for Central & South Asia, Fellows Directory-2014. The World Academy of Sciences for Advancement of Science in Developing Countries, JNCASR, Bangalore.
6. <http://twas-old.ictp.it>

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Fostering innovative processes for promotion of animal sciences

During the past decade, multipronged actions were initiated for promotion of basic research in animal sciences by the erstwhile SERC of the Department of Science & Technology (DST), New Delhi and the recently established Science and Engineering Research Board (SERB), a statutory body under DST. Several innovative processes were initiated to foster and promote basic research in animal sciences – the study of organisms from ecosystem to molecular level – through ‘new initiatives’ and ‘capacity-building activities’.

The new initiatives include: (i) ‘intensification of basic research in bird biology’ and (ii) ‘strengthening of faunal research in North East India’. Substantial number of new, fundable projects were generated under each programme after screening a large number of concept proposals and organizing interaction meetings with experts and potential researchers. The capacity-building activities include a series of schools in different sub-areas of animal sciences, such as chronobiology, neurosciences, herpetology, chemical ecology, avian biology and interaction meeting on helminth studies. The schools were meticulously planned to achieve long-term systematic manpower development and value-addition to R&D proposals. The long-term goals of the programmes are to modernize the study

of animal sciences and to build long-term scientific human resource with sound technical base for teaching and research, and to initiate and strengthen research programmes relevant to current needs of Indian science. The activities were aimed to provide interdisciplinary environment as opposed to traditional departments in most universities in India.

The schools, workshops/interaction meetings, etc. with a focus on the future were conceptualized, formulated and organized to establish long-term planning process, determine and understand current and needed core competencies, and to make plans to meet future needs. Each school was organized in an academic environment under the supervision of a Planning Committee which formulated the curriculum, planned the course and faculty, ensured selection of a heterogeneous group of participants from all over the country and provided direction with respect to scheduling, structuring, monitoring and reviewing the progress of each school. The Planning Committee constantly monitored the activities of the school, provided suggestions for improvement or rectification, if required, and ensured continuous improvement of the activities of the schools. The activities involved faculty members from different parts of the country and abroad. Participants were also selected from

different parts of the country by the respective planning committees and were heterogeneous in nature. About 20–25 participants from all over the country were selected for each school for a duration of about two weeks. Gender parity was also kept in mind while selecting the participants. Best faculty from different parts of the country were involved in the schools. Workers in the field with excellent credentials and teaching skills were invited. They were requested to teach within the framework of the syllabus designed by the respective National Planning Committees.

Prior to the commencement of the schools, the selected participants were provided with soft copies of the literature and reviews in the field so as to prime them for the event. The conduct of the schools started with an orientation programme for the first two or three days. During this period, the students were taught fundamentals of the subject with a view to offer level play field to all participants, and also to prepare them for the advanced training to be given in the school. The schools imparted intense training in theory and hands-on exercises. Each school was conducted in accordance with a timetable that provided for classroom teaching, and question-answer sessions, group discussions, panel discussions and evening talks.