Researchers in India deserve better

Academics and researchers in India deserve better in terms of incentives and facilities to pursue priority research themes of national importance. The incentives provided especially to retired professionals who have contributed handsomely to science and society are woefully inadequate. In this context, the existing schemes funded by various ministries of the Government of India that allow highly acclaimed superannuated academics and researchers to pursue research of national importance are archaic and need to be reviewed in the current disposition. In India, one cannot underestimate the contribution of this critical mass of highly experienced and knowledgeable individuals who have displayed their immense potential in developing novel and innovative techniques, approaches and strategies in diverse research areas important for nation building. These individuals also contribute to mentor young and upcoming talented researchers. In the existing set-up the superannuated academics and researchers are nominated through a professionally managed selection process conducted by the concerned ministries and those selected are called either Emeritus Scientist (ES) or Emeritus Professor (EP) depending upon their professional experience. The duration of the scheme generally spans three years that includes an honorarium of twenty thousand rupees per month for ES (or EP), and permission to engage a Research Fellow (or a Research Associate, RA) with the contingent grant ranging between fifty thousand and one lakh rupees per annum. In the event of engaging a RA, the ES (or EP) in comparison draws much less fellowship. This is a paradox of sorts. In the current inflationary dispensation the honorarium is highly inadequate, especially for those who have to commute a substantial distance to visit the host institute and/or those who do not enjoy pension benefits. It is difficult to comprehend the reason for such an attitude of our managers of science in this matter. And this state of affairs reflects total disregard of the significant contributions of acclaimed academics and scientists of yore. What can be done? The authorities just need to sit and brainstorm on this subject matter. The guidelines of the existing schemes were developed long time ago and have not been periodically reviewed. Through this correspondence I wish to remind our learned managers and authorities to look into this issue sooner than later.

UPPEANDRA DHAR

G.G.S. Indraprastha University,
Sector 16C, Dwarka,
New Delhi 110 078, India
e-mail: uppdhar@gmail.com

Collaborative research can be a viable alternative to outsourcing

Outsourcing has become an inevitable part of research these days. It has truly fast-tracked the output of research. However, many concerns are associated with outsourcing, including the authenticity of the results[1].

There are many reasons why researchers outsource experimental work. (i) Non-availability of adequate amount of funds to procure high-cost instruments, (ii) Lack of skilled manpower to run sophisticated and high-throughput instrumentation facilities, wherever they are available, (iii) High maintenance cost leading to underutilization of instrumentation facilities. It has been seen that institutions having high-cost instrumentation facilities do not get sufficient number of samples for analysis and the cost for the small number of analyses performed can be so high that outsourcing is a preferable option.

Promotion of collaborative research is thus the need of the hour to combat such situations. Collaboration among different public-funded institutions, academia and industries for availing the high-cost and high-throughput instrumentation facilities will maximize the extent to which these are used. Further, the authenticity of the results will be unquestionable and will cut the cost of analysis, which will result in greater benefits to researchers as well as the funding agencies.

1. Tayyab, S. and Boyce, A. N., *Curr. Sci.*, 2014, **166**, 789.

ARABINDA MAHANTY

ICAR-Central Inland Fisheries Research Institute,
Barrackpore,
Kolkata 700 120, India
e-mail: mahantyarabinda1@gmail.com

Tanjore pills

The arsenic and mercury-containing Tanjore pills used in treating snake bites in the 18th century Madras Presidency by Raman *et al.*[1] is a good example of how researchers can make an article in the 'Historical Notes' section interesting by meticulous research. (No offence intended, but our history teachers in school tend to make the subject dull and boring.) The readers got to read a fascinating article on 'Tanjore pills' with references ranging from 1788 to 2013. I was intrigued by the fact that Russel and Duffin (surgeons in Vellore Hospital) found arsenic and mercury in the pill. What was more intriguing was that although they found this remedy to be 'fallacious both in the case of snake bites

and of mad dogs', they were still 'inclined to think favourably of it, and encourage the hope that further experience might confirm its good character'. There cannot be a better example of scientific temper combined with humility. In modern times we are no longer surprised to read about 'toad venom' or 'scorpion venom' being researched to produce newer and more powerful analgesics to mitigate the sufferings of terminally ill cancer patients. To quote from *Lehninger's Principles of Biochemistry* (V edn, p. vii) 'Science is both a way of thinking about the natural world and the sum of the information and theory that result from such thinking'.

1. Raman, R., Raman, A. and Ram Manohar, P., *Curr. Sci*., 2014, **106**, 1759–1763.

SASHIDHAR

15, 4th Cross,
Asheerwad Colony, Banaswadi,
Bangalore 560 043, India
e-mail: vrsashi@yahoo.com

Indian American whiz kids

An article in *Washington Post* (12 May 2012) about the results of the National Geographic Bee held the previous day, mentioning that a number of Indian American children were winners, piqued my curiosity and made me look deeper into it.

The National Geographic Bee[1] is a contest held annually since 1989, open to children from fourth to the eighth grade across the US; about five to six million students enter each year. After exhaustive tests at various levels, each state is represented by a state-level champion for the national contest and finally 10 finalists are assembled in Washington, DC. Each of the 10 participants is guaranteed a reward of US$ 500, with the top four given scholarships of US$ 25,000, US$ 15,000, US$ 10,000 and US$ 1000, in that order. The national champion is also given a lifetime membership of the National Geographic Society and a trip to the Galapagos Islands.

I was amazed to find an impressive number of Indian American children among the top 10 finalists in the most recent nine years, including the first position in six of those nine years (Box 1). In addition, many state champions each year were Indian Americans.

Clearly, one, two, three or all four of the top four positions have been taken by Indian American children in each of the last nine years (2014 to 2006), with as many as 7 and 8 out of the top 10 positions in 2012 and 2013 respectively. This record is particularly striking since the Indian Americans constitute less than 1% of the US population[2].

Intrigued to find out if this is a rare phenomenon specific to one subject, namely geography, I examined two more topics, science and technology, and English spelling, in order to establish if there is a general trend with the young Indian Americans.

The Intel Science Talent Search[3] began in 1941 as the Westinghouse Science Talent Search. In 1998, INTEL took it over and renamed it the Intel Science Talent Search (ISTS). The ISTS is the most prestigious competition in science open to high-school seniors in the US and encourages students to tackle challenging scientific questions and develop skills necessary to solve the problems of tomorrow. Typically about 1600 students in the US enter this contest every year. Of them, 300 are selected as semi-finalists based on the project proposals they submit. Then, in the next stage, 40 are chosen as finalists after a detailed examination of their proposals and invited to Washington, DC to compete for the top 10 awards. The top three winners get a scholarship of US$ 100,000, US$ 75,000 and US$ 50,000 respectively, while the fourth to the tenth place winners get US$ 25,000 each. Many of the earlier winners have made their mark in science nationally and internationally, winning eight Nobel prizes, two Field medals, five National Medals of Science and 17 MacArthur Foundation fellowships.

Considering the prestige and challenge associated with this most coveted award among the brightest high-school students in the US, it is commendable and heart-warming that Indian American high-school seniors have exhibited exemplary, even enviable performance. Just considering the most recent seven years (2008–2014), two Indian Americans won the first place (Shivani Sud in 2008 and Nitin Tumma in 2012), one won the third place (Akhil Matthew in 2010) and nine in the fourth to tenth place (Narendra Tallapragada, Preya Shah and Nilesh Tripuraneni in 2009; Neel Patel and Anirudh Prabhu in 2012; Akshay Padmanabhan and Sahana Vasudevan in 2013; Anand Srinivasan and Shaun Datta in 2014) making up a total of 12 out of 70 finalists in this 7 year period. It may be mentioned that three more (Vivek Venkatachalam in 2002, Naveen Sinha in 2003 and Ryna Karnik in 2004) gave impressive performance among the top ten. In addition to these top winners, a number of others were in the 11th to 40th positions (6 in 2004, 5 in 2005, 3 in 2006, 3 in 2007, 7 in 2008, 6 in 2009, 5 in 2010, 8 in 2011, 4 in 2012 and 8 in 2013). As high as 25% of the finalists in 2004–2014 are Indian Americans, an amazing record. Out of the 300 semi-finalists, there were 52, 61 and 65 Indian American children in the three most recent years (2011–2013), amounting to nearly one in 5 semi-finalists. It is heartening to note that a large number of girls are among the top ranks.

The research topics proposed by these young winners, who are high-school students and 18 years or younger, are advanced and, indeed, mind-boggling.

Nitin Tumma (1st in 2012): project for slowing the growth of breast cancer cells, a step which may help in treating the disease.

Shivani Sud (1st in 2008): a bioinformatics and genomics project that focused on identifying stage II colon cancer patients at high risk for recurrence and the best therapeutic agents for treating their tumours.

Akhil Matthew (3rd in 2010): a mathematics project on Deligue categories, a setting for studying a wide range of algebraic structures with ties to theoretical physics.

The Scripps National Spelling Bee[4] competition is being held annually since