Need for excellent institutes, multidisciplinary Ph Ds and useful discoveries in India

The editorial 'The mirage of world class institutions' is didactic and highly reflective[1]. Balaram raises some pertinent questions, offers some useful comments and suggests steps to create world-class institutes. In this context, I quote Morton Schapiro, President of the Northwestern University, USA[2]: 'you cannot create a world class university overnight'. According to him, combining access with affordability and ensuring high-quality undergraduate education are vital for building such an institution.

In India, there has been a tremendous expansion in education with 540-plus universities and 26,000 colleges[3]. But this number is supposed to cater to only 12% of the eligible candidates. According to Kapil Sibal (Minister of Human Resource Development and Minister of Communications and Information Technology), we require 1500 universities and 40,000–45,000 colleges. Even then we fall short when compared to the enrollment in Western countries. At present, a large number of capable students are unable to enter government institutes in view of their limited number and are forced to join private institute shelling out a lot of money. Though there has been progress in the quantity, the quality in institutes is variable. Hence, the government has a serious responsibility to cater to the needs of millions of aspirants through an increase in both quantity as well as quality of institutions.

India also needs more number of Ph Ds than the present 8000-plus. It is likely that 20,000 Ph D students will graduate every year till 2020; this is equivalent to just 1% of the total number of undergraduates[4]. A subject-wise quantitative requirement of Ph Ds is essential for planning – this does not exist at present. The large number of Ph D aspirants can be harnessed to solve the numerous problems facing the country. Science alone should not be treated as a panacea for these problems and scientists should not think that science would remain unaffected in spite of these difficulties. Scientists and technologists should work in close collaboration with academicians from the arts and humanities. When so many advanced countries are worried about the number and utility of Ph Ds and thinking of serious reforms[4–7], we cannot remain unconcerned about our Ph D system. This exercise is a responsibility of policy makers, funding agencies and academicians.

Our academicians should strive to identify the practical problems facing the country, work on them and persevere till they are solved. John Bidwell[8] once said that useful discoveries are different from exciting discoveries. Mark Taylor[5] has used the expression 'practical problems' citing the example of providing clean water to a growing population. Our emphasis should be on making useful discoveries. To sum up the opinions of Bidwell[8] and Taylor[5], the curriculum should focus on existing practical problems, and our teaching and research should be relevant to this curriculum. Adequate and authentic classified information about these problems and their current status must be open to the public. Every problem needs time, capital and expertise to solve. Policy makers and funding agencies should accordingly grant funds and encourage collaborations. Performers should be provided adequate resources for the required time and greater autonomy as incentives to persevere in academics and contribute to solving problems.

These approaches can enable the development of some highly useful albeit delayed world-class institutes in the country.

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Traditional use of *Calotropis procera* R.Br. against migraine

Migraine, a neurological disorder[1–3], is locally called vanti champa noppi in Chittoor District, Andhra Pradesh. Usually migraine causes episodes of severe or moderate headache (which is often one-sided and pulsating) lasting between several hours and three days, accompanied by nausea (vomiting) and a heightened sensitivity to bright light (photophobia) and noise (phonophobia)[4].

One year prevalence of migraine ranges from 6% to 15% in adult males and 14% to 35% in adult females[5]. These figures vary substantially with age: approximately 4–5% of children aged under 12 suffer from migraine, with little apparent difference between boys and girls[6]. There is a rapid growth incidence amongst girls occurring after puberty[7], which continues throughout early adult life[8]. By early middle age, around 25% of women experience migraine at least once a year compared to men[9]. After menopause, migraine attacks in women tend to decline dramatically, so that above 70 years there are approximately equal number of male and female sufferers, with prevalence returning to around 5% (ref. 5). Many people report that one or more dietary, physical, hormonal,

emotional or environmental factors precipitate their migraine. The most often reported triggers include pesticides (sprayed fruits/vegetables), perfumes or fragrances (30% of sufferers) stress, over-illumination or glare, alcohol, food, too much or too little sleep and weather. Some women experience migraine in conjunction with monthly menstrual cycles. Sometimes migraine occurs with no apparent cause (http://psychology.wikia.com/wiki/Migraine_headache).

The genus *Calotropis* (Asclepiadaceae) is represented by two taxa, *C. procera* and *C. gigantea*. These have numerous uses and are of mythological importance among the Hindus[10,11]. The tender leaves of *C. procera* are used in the form of a capsule for the treatment of migraine along with water on an empty stomach for 3 days[12]. Mature yellow leaf juice is also inhaled by persons suffering from migraine[13].

The traditional medicinal information has been gathered from rural people in Chittoor District and some urban areas by recording the usage method of the drug and observing the curative effect of this herbal drug against migraine. Some residents of Bhakarapet Panchayat reported on the traditional use of the dried stem fumigations of *C. procera*. The dried stem which is hollow but closed at the nodes, is cleared using a needle. This hollow stem is burnt at one end to produce fumes from the other end of the stem. These fumes are inhaled from the left nostril if the migraine is on right side of the head and vice versa. Many people from rural areas and urban areas have thus been cured from migraine. Apart from extensive usage of modern medicine for migraine, people still depend on herbal medicines. Many people reported that migraine never recurred after they had used the stem fumes of *C. procera* once or twice. The fumes may be providing permanent cure against migraine. Further research will open new avenues for the application and improvement of traditional remedies and to develop a medicine in the form of an inhaler for migraine.

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Indian scientists and the archives of the American Institute of Physics

Indian men of science have been unable to create a central archive on the history of science. Also, most of the Indian historians of science do not give credit to archives or acknowledge the sources of their information. Thus, these sources remain obscure or unknown to future historians and in the worst cases, the material disappears forever.

As cases in point, I have reproduced two figures. The first (Figure 1) is from *M. N. Saha in Historical Perspective* (Gupta, J. (ed.), Thema Publishers, Calcutta, 1994; plate after p. 88). The reference for the photograph has not been acknowledged. This photograph seems to have been scanned from a Bengali journal and appears on the webpage of the American Institute of Physics (AIP) on typing 'Bose' in 'quick search' at http://photos.aip.org/.

Figure 1. (From left to right) Sitting: M. N. Saha, J. C. Bose and J. C. Ghosh; Standing: S. Datta, S. N. Bose, D. M. Bose, N. R. Sen, J. N. Mukherjee and N. C. Nag (Kolkata, 1930).