

more respectable than Balasubramanian's. And yes, in the past I have extended the 'Indian' registration fee to participants from other impoverished countries, such as the former Soviet-bloc countries.

As for the comment that international conferences held in India under the auspices of international professional societies are *forced* to charge the same

registration fee for all participants, surely he should know that such a policy would exclude most Indian scientists from participating in such events. Indeed, many Indians suspiciously view these events as jamborees for overseas participants to have a vacation in India, untainted by any contact with the indigent locals.

I for one am all in favour of differential fees. If someone does not like it, he doesn't have to attend the conference – as simple as that!

M. VIDYASAGAR

8-2-120/120/A/14, Plot No. 3,
Road No. 14, Banjara Hills,
Hyderabad 500 034, India

The teaching of mathematics

The teaching of mathematics is an art and science as well. Unless one can master the basics of this art and science, one can never become a successful teacher of mathematics. Any kind of artistic work requires imagination, a sense of beauty and skill on the part of the artist. Mathematics teaching too, requires all these. Any branch of science on the other hand, requires an analytical mind, controlled emotion, a deep sense of logic and an explorative attitude. Every science is based on some basic principles which control all phenomena – all derivations. Success in teaching mathematics depends not only on the knowledge of mathematics, but certainly on the creativity of the teacher also – on his understanding of the basic principles of teaching and the psychology of students. This is true particularly because of the nature of the subject. Mathematics as a subject

is totally different from other subjects. Indeed, the joy and excitement of learning mathematics does not lie in the imagery or in the suspense of events or in the establishment of theories and ideas, but in the precision of arguments – in the search for pattern – in the successful interpretation of natural phenomena.

Teaching is not merely delivery of sets of information. Mathematics teaching means persuasive arguments to pass a quantum of knowledge from the teacher to the taught. Thus the primary objectives of teaching may be identified as developing: (a) an interest and love for the subject; (b) an analytical bent of mind, i.e. a sense of logical reasoning; (c) an aggressive attitude to attack new problems and to intrude upon new ideas and new concepts; and (d) confidence.

To achieve the above objectives, one has to have a differential approach depend-

ing on the level of a course, the quality of the students, and nature of the component to be taught.

In fact, teaching mathematics requires many things material, but unless there is a rapport – a willingness on the part of the teacher and the taught, it is bound to fail. It is not a marketable commodity that can be sold and purchased. It is to be inherited by the lover of mathematics and bequeathed to the lover deliberately and not by coercion or force. Neither the most decorative classroom with costly projectors nor a wonderfully rich library can achieve full success, unless there are good teachers to carry forward the flying colours of the queen of science.

D. CHATTERJEE

*St Xavier's College,
Institute of Engineering and Management,
Kolkata 700 016, India*

Plight of scientists at the Bose Institute

Bose Institute, a premier research institute of India, was founded in Kolkata in 1917 by Acharya J. C. Bose, to carry out research in the physical and biological sciences. Apart from the path-breaking contributions of the founder, early detection of the mu meson by D. M. Bose and discovery of cholera enterotoxin by S. N. De originated in this institute. This is one of the very few research institutes in the country ideally suited for multi-disciplinary research. Shortly after independence, the institute came to be funded by the Department of Science and Technology (DST), Government of India. It is the DST that exclusively provides funds for the running of the institute at present.

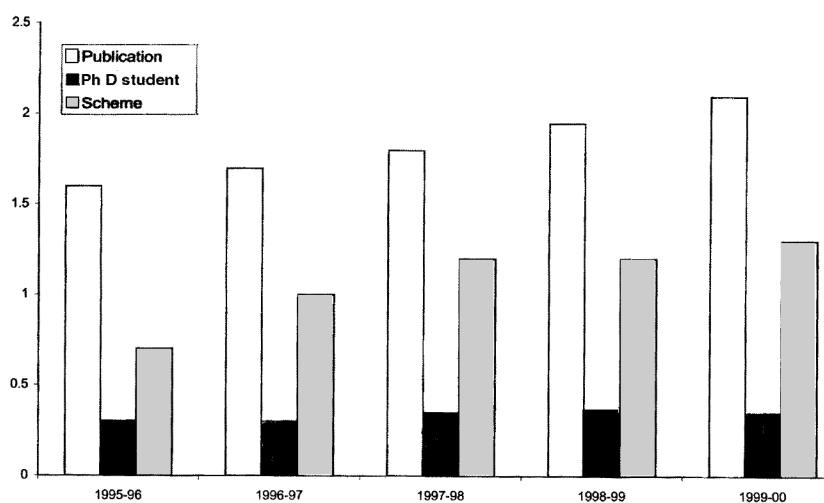
Since the mid-nineties, these funds remained at the minimal level, barely sufficient to meet the infrastructural requirements (salary, electricity, telephone bill, etc.). For last five years, practically the entire research funds are being obtained from external funding agencies (CSIR, DBT, DST, DAE, ICMR, INDO-US, INDO-EEC, etc.), both national as well as overseas, to individual scientists (as principal investigators) against submitted and peer-reviewed research proposals.

Since 1998, however, Bose Institute has been going through an acute financial shortfall, and even the above minimal funds have become insufficient. This happened due to a number of reasons, the

foremost amongst which is the burden of additional salary and pensions arising out of the pay revisions recommended by the Fifth Pay Commission. The Council of the Bose Institute has discussed these matters and extra funds were sought from DST to make up for the arrears and current shortfall. The latter, however, has not so far been able to provide the requisite funds, despite having committed to meet the shortfall. The reasons for the delay are unknown to us, but it is evident that the delay has allowed the shortfall to build up and accumulate. This has led to the present critical situation with a consequent deleterious effect on the scientific research activities of the insti-

Table 1. Decreasing trend in the number of faculty members, research students and journal subscription

Year	Number of faculty members (No. of sanctioned posts = 72)	Number of research students and postdoctoral fellows	Library		
			Grants (rupees in lakhs)	Expenditure for books and journals (rupees in lakhs)	Number of journals subscribed
1997–1998	63	198	40	37.27	59
1998–1999	60	171	40	56.72	113
1999–2000	54	169	20	2.28	16
2000–2001	53	120	25	16.64	34
2001–2002	50	125	No budget allocated so far		0

**Figure 1.** Number of publications, Ph D students and schemes per faculty member.

tute. This is evident from the declining numbers of the faculty and research students, as well as journal subscriptions at the library (see Table 1). As many as thirty per cent of the academic positions are lying vacant and subscriptions to all journals in the library have stopped. From 1993, the institute provided a meagre start-up fund of rupees two lakhs to each new faculty. This has completely stopped since 2000. The Internet/e-mail facilities require upgrading and there are frequent breakdowns of the system. For

lack of funds, even repair of essential facilities like cold rooms, equipments and lab spaces cannot be undertaken. This has led to a general feeling of demoralization all around. The financial crisis has also resulted in a huge and inordinate delay in the utilization of extramural research funds and execution of funded projects, pushing us further behind. With utter dismay we note that nobody appears to be concerned about the miserable state of affairs prevailing since 1998 while we, the scientists, have been suffering. The

existing institutional authorities have failed to take any meaningful initiative to solve this problem. The institute is without a permanent Director for well over a year, compounding the problems and adding to the gravity of the situation.

In spite of these trying conditions, we have so far performed to the best of our abilities and at par with other premier research institutes in the country, as is evident from the number of research projects we have attracted, the number of Ph Ds produced and the number of research papers published (see Figure 1). However, our endurance has reached its limits and it is difficult for us to remain silent any longer. With no signs of any redressal in the near or distant future, we, the scientists of the Bose Institute are alarmed. Scientists, crippled by the lack of essential research infrastructure, cannot function in a meaningful manner. It is our general feeling that the institute is rapidly approaching a point of no return.

Bose Institute, a significant part of the history of India, is also a part of our heritage. We write this letter to bring to the notice of our fellow scientists all over the country, our plight and helplessness at this rapidly deteriorating situation in our institute. We should not be silent spectators as the legacy of Acharya J. C. Bose, his 'gift to the nation', is allowed to wither away due to the persistent indifference of the powers that be.

SUJOY K. DAS GUPTA
K. P. DAS

*On behalf of the Academic Council,
Bose Institute,
Kolkata 700 009, India*
(The Academic Council, a body recognized by the Bose Institute Council, represents all the faculty members of Bose Institute).

On scientific re-evaluation of traditional herbal medicine

This is with reference to the correspondence of Kaushal Kumar and Singh (*Curr. Sci.*, 2001, **81**, 231) arguing for the preservation of cultural heritage of ethnoherbology and consideration for the traditional methodology of drug preparation during their scientific evaluation. We

would like to cite a couple of observations made during our efforts to document the medical ethnobotany of coastal Karnataka which appears to be relevant to the topic and thereby to stress the need for re-orientation in the objectives of scientific verification of traditional views

and evidences from an inspiring book on the science of ethnobotany by Balick and Cox¹.

We are of the opinion that the modern scientific methods of verifying the efficacy of traditional herbal cures are to be better called 're-evaluation' efforts, because