

Importance of good teachers and leaders of research

P. K. Gautam¹ has focused on the need of good teachers for improving our scientific attitudes and capabilities in research. He has attributed the lack of creativity, innovation, inability to articulate, lack of clear thinking and decline in verbal and written skills to our education system. I agree with his viewpoint, but I differ with the remedies suggested by him. We cannot apply the defence force strategies and techniques to improve our education system. Grooming of intellectuals and teachers requires a different environment.

It is unfortunate that the Indian government has given a low priority to education at all levels, i.e. primary, secondary and higher education. Hence the teaching profession does not attract talented students. It is almost the last choice these days after engineering, medicine, business and information technology. The situation has gone from bad to worse during the last decade. Being in the teaching profession for the last 38 years, I am fully conversant with the weaknesses of the Indian education system. Some of the ills identified and remedies suggested are as follows:

- (i) The medium of instruction for primary school education should be the mother tongue of the student. Primary teachers-training programmes should be conducted at the state level.
- (ii) Secondary school education has assumed a pivotal role in India and the students have to pay a heavy price for entry into any professional course. There should be just one entrance test at the national level like in European countries. Teacher-training programmes at the secondary level should be conducted by National Council of Educational Research and Training (NCERT), New Delhi by designing package programmes for each professional stream. Project work has to be introduced to improve analytical thinking and written skills among students and teachers.
- (iii) There is no training programme for teachers at different levels in university education. Academic staff colleges started by UGC on the pattern of defence colleges, have failed to serve the purpose. The teachers are only interested to get a certificate of attendance for promotion under the Career Advancement Scheme of UGC. No rigorous training is imparted in teaching methodology or research techniques. UGC must abolish these colleges and introduce assessment of teachers by the students as found in Europe and USA.
- (iv) University teachers must have free access to the research facilities available in both state and national

level institutes, as already started under UGC-DAE joint venture/collaboration. Indian Academy of Sciences, Bangalore has also taken some bold initiatives.

- (v) Last but not the least, rotation of headship in universities allowed by UGC must be either stopped or reviewed. It has created more problems rather than solving these. The concept of grass-root democracy is good, but it has failed to provide leadership qualities in education and research in the Indian university system.

Unfortunately, we Indians believe in *status quo*. Unless some revolutionary changes are introduced as a damage-control measure, our education system will fail to produce world-class intellectuals or leaders.

1. Gautam, P. K., *Curr. Sci.*, 2001, **80**, 483; and references quoted therein.

H. S. VIRK

*Department of Physics,
Guru Nanak Dev University,
Amritsar 143 005, India
e-mail: virkhs@yahoo.com*

The Bradman class, spiritualism and scientists

The editorial (*Curr. Sci.*, 2001, **80**, 717–718) is a welcome change from science to cricket, but one fails to appreciate the theme propounded in it to project Bradman as a measure for the scientists. It is illogical to do so because their contributions are of a totally different nature. Bradman undoubtedly is great in his game and would have got a Nobel Prize, had there been one for sports and games. But his contributions to cricket, which is a time-bound phenomenon and at best academic, cannot match the scientific contributions of Newton, Fara-

day, Pauling, Woodward, etc. to the society and to the world, in utility and application – and to science in general – and which has permanence. Secondly, Bradman's skill as a batsman was competitive, depending on the competence of the bowlers and fielders of the rival teams. On the other hand, the competence of scientists is absolute and not relative, in spite of the fact that achievements in science have become dependent on group activity. Thirdly, if Bradman's batting average of more than ninety runs in tests is not likely to be

bettered in the future, it is because the game of cricket has become so professional, involving money and so tight-scheduled throughout the year that even the best of the top players get tired mentally and physically, and are not able to give their best uniformly in all the tests. Sachin Tendulkar and Brian Lara are apt examples for this.

One factor which must have been common in Bradman and the scientists and which must have inspired them to do the 'sadhana' to attain excellence, is spiritualism. This incidentally the edito-

rial has missed to mention. Each one of us is endowed with this spiritualism to various extents. It is this spiritualism which converted dacoit Valmiki into a 'Maharishi'. It is this spiritualism which turned the intense love of Tulsidas for his wife into divine love and he became a saint. It is in this virtue that Bradman

and the scientists can be compared and not in their contributions.

The caption of the cartoon at the end of the editorial does not do justice to the strike-bowlers like Larwood, Jardine, Lillee, Walsh, Kapil Dev, etc. who according to the editorial belonged to the Bradman class and who contributed to

the overall performance of the team as much as Bradman did.

Y. K. GUPTA

*J/5, Phase II,
Shivalik Nagar,
Hardwar 249 403, India*

Fading fragrance of musk

Once well-distributed across the entire Himalayan tract, the musk deer is now facing extinction. In the Himalayan belt, its population is currently believed to be less than 2000. The musk deer is listed as 'endangered' in the *Red Data Book* of IUCN (1974), in Appendix I in Convention on International Trade in Endangered Species (CITES), aiming at prohibiting musk trade at the international level and in Schedule I of the 1972 Wildlife Protection Act of India and 1991 Wildlife Protection (Amendment) Act of India. However, despite adoption of some conservation measures, poaching of musk deer continues virtually unchecked and trading still persists on a large scale.

The musk deer (*Moschus moschiferous* Linnaeus)¹ belonging to class-Mammalia, family Cervidae has been used by humans for various economic, aesthetic and socio-religious purposes since time immemorial. It holds a place between deer and antelopes, and is regarded as an under-developed form of the deer, which has not progressed with the rest of its family. This timid and solitary animal weighs about 9.5–11.5 kg and has a gall bladder, with males having a pair of canines and the musk gland which lies below the umbilicus just in front of the prepuce. The pod attains its full size of about 4 cm, when the deer is 136 weeks old. The weight of the pod varies from 40 to 70 g, containing 10–40 g of fresh musk in solid or semi-solid state.

The musk produced from the age of 2 to 14 years in the male deer, contains an alkaloid—muscone. Musk also contains macrocyclic compounds, steroids, proteins, esters, waxes, urogenic salts² and the male hormone—androsterone³.

The unique flavouring quality of musk is one of the important factors for its high value in the international market. Besides flavouring delicacies, it is also used in costly wines and in perfumes for its fragrance. It is highly revered for its medicinal value in Ayurvedic (Indian), Unani, Tibetan (Amchi) and Chinese systems of medicines. References about curative properties of musk are found in the writings of 11th century Arab physicians⁴. Musk is regarded as a cardiac and general stimulant; it increases blood circulation and raises the arterial tension. It is also used as an aphrodisiac, antispasmodic and in chronic cough. Used in 150 Ayurvedic system of medicines, it is described as a life-saving drug⁵.

The gelatinous brown musk secreted by the deer fetches US \$40,000 to 60,000 per kg in the international market⁶. Available data put the value of global musk trade in the US at \$9 million to \$10 million and it is expected to rise.

The musk deer is victimized due to its own possession—the musk gland. Normally about 150 musk deer are killed for one kg of musk⁷, whereas musk can be easily collected from the animal by the process of milking and other simple means, as the pod has a natural orifice. Once extracted, the musk is formed again within a year.

In the Himalayan region, poaching of musk deer is highly organized and poachers operate in groups. Each hunting trip into the jungle lasts over a week and about 15 animals are killed to get 5 pods. Shooting is the most discriminate method of picking the male. However this method is rarely favoured because of the risk of detection by forest officials. Snares, poisoned spears and tracking dogs are the other means used by poachers to kill the animal.

Habitat destruction is the second important factor responsible for the decline of the species. In the countries of erstwhile USSR (mainly Russia) and China musk deer farms have been established for their rearing and breeding. In these farms, techniques are standardized to collect musk from the gland without killing the animal^{8,9}. In India, sporadic attempts by some ardent wildlife workers paved way for the establishment of three musk deer centres.

Conservation of this rare animal is of utmost importance today, as it is fast heading towards total extinction. Instead of lamenting for the past follies, we should take all necessary steps to conserve the deer in both *in situ* and *ex situ* conditions.

1. Tsalkin, V. I., *Sistemática kabargi*, V. Kn. Oleni, USSR, 1947.
2. Mahajan, J. R., *Quim. Nova*, 1982, **5**, 118–123.
3. Waki, I. and Kumura, M., *Wakan Iyaku Gakkaishi*, 1984, **1**, 218–221.
4. Joshi, G. C., Tiwari, K. C., Tiwari, R. N. and Pandey, G., *Indian For.*, 1993, **119**, 798–803.
5. Uniyal, M. R., *Sachitra Ayurved* (in Hindi), 1988, pp. 1–195.
6. Green, M. J. B. and Singh, A. N., in *Wildlife in India* (ed. Saharia, V. B.), Natraj Publishers, Dehra Dun, pp. 173–190.
7. Doval, N. K., *The Hindu*, 2 August 1989, p. 20.
8. Ustinov, S. K., *Zool. Zhurnal*, 1969, **48**, 1558–1563.
9. Zeng, S. and Nanwin, R. I., *Acta Theriol. Sin.*, 1984, **4**, 35–42.

IRA TEWARI

*Department of Forestry,
Kumaun University,
Nainital 263 002, India
e-mail: iratewari@yahoo.com*