

ever made any statement that earthquakes cannot be predicted. Contributions in the form of probabilistic estimations and projections in various fields of national development by P. C. Mahalanobis and the Indian Statistical Institute are quite well-known.

It will be useful to know some points about the theory and development of probability. Systematic analysis of non-demonstrative arguments is an important task of logical theory. Non-demonstrative reasoning received some attention from thinkers in the ancient and medieval periods. Following Pascal and Fermat, a series of distinguished investigators, including Jakob and Daniel Bernoulli, Abraham de Moivre, Jean d'Alembert, Thomas Bayes and Joseph Louise Lagrange, esta-

lished fundamental theorems of probability and showed how, on the basis of apparently simple assumption, the probability of such complex events as that of obtaining two sixes at least once in 24 throws with two dices can be found. These achievements were extended and unified by Pierre de Laplace in his work, 'Theorie analytique des probabilites'. Contributions of contemporary thinkers during the last few decades to various fields all over the world are quite well-known.

According to the philosophy of probability theory, the findings should be justifiable, self-evident, sound and rational. It is felt that the DG should have remembered these fundamental guiding principles of probability. His statement has totally nullified the good work of finding

the probability of occurrence of earthquakes in Uttarakhand. Instead, he could have observed, '...we have identified seismically vulnerable areas with high probability of occurrence, but we cannot predict the exact time of occurrence of earthquakes...'.

1. Raghu Kanth, S. T. G. and Iyengar, R. N., *Curr. Sci.*, 2006, **91**, 1486.
 2. Singh, S. K. *et al.*, *Bull. Seismol. Soc. Am.*, 2002, **92**, 555.
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Reviving quality in plant science education

The quality of postgraduate teaching in plant sciences is declining in India. Many of the botany departments in Indian universities have shifted from traditional M Sc courses in botany or plant sciences to courses like biotechnology or genetic engineering. Even the teachers of botany are not confident about the relevance of their subject, the same being reflected in the mindset of the students. The postgraduate syllabus of botany courses in most of the Indian universities is on par with the international standards. Unfortunately some of the new topics mentioned in the syllabus are not taught in the class due to lack of knowledge of the teachers. The UGC is spending lakhs of rupees to conduct refresher courses in order to equip teachers regarding the recent advances in science. But only a few of them benefit from these refresher courses. Majority of the teachers attend these programmes only to get promotions.

If we analyse the quality of knowledge acquired by the students now and compare it with the students of the early 70s or 80s, there is a tremendous decline in the acquisition of knowledge. Even though we speak of interdisciplinary approach nowadays, it is not new to plant sciences as such. If we analyse any of the books written in the early 60s or 70s, we can see that most of the science books in

physiology or even anatomy have successfully explained biological problems using various physical, chemical and mathematical terms. Unfortunately books published nowadays lack this approach, reflecting the quality of the authors.

There are various factors that affect the declining standards in plant science education. Some of them are listed as: (1) More importance given by teachers to certain courses like biotechnology, without understanding their meaning. (2) Importance given to record-drawing, making many wonder if botany is an art. (3) Negligence of basic subjects like taxonomy, anatomy, histochemistry, cytogenetics, etc. (4) Importance given to molecular biology tools and techniques. (5) Over dependence of substandard guide-like textbooks. (6) Lack of multidisciplinary approach in the teaching process. (7) Inability of teachers to convey the application of the subjects taught in class at the industrial level. (8) Poor practical training in the laboratory. (9) Lack of industrial academic training.

If we analyse the attitude of our students, they may be able to explain concepts in molecular biology, but cannot correlate them to classical genetics. Likewise, they are trained in various molecular biology tools like electrophoresis, but are unaware about its physical process.

Faculty capable of doing micrometry or histochemistry are also becoming rare.

Plant science is the gem among various science subjects. It has to be nurtured for the well-being of the human and scientific community. The varied metabolic pathways of plants may provide answers to many of the problems faced by the human community, especially in the development of new drugs and 'designer products'. Phytodrugs will be a major business in the international market. Some private colleges in India have already started courses like phytomedical sciences and technology, keeping in mind the prospects of the subject.

Being a country rich in biodiversity, it will be a big loss for us if we do not have well-trained plant scientists in the future. DST along with UGC should initiate steps like providing scholarships and free and compulsory training at various research institutes as part of their academic programme to students who pursue postgraduate education in plant science.

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