

## The Himalayan fossil fraud and its aftermath

The *l'affaire* V. J. Gupta has taken a queer turn. Despite national and international protests from scientists, academics and scientific societies and also indictment by no less a person than Justice M. S. Gujral, Chief Justice (Retd.), Sikkim High Court, appointed by the Panjab University Syndicate to enquire into various allegations against Gupta, the Panjab University has let him go with a mild censure which amounts to a blatant disregard of ethical values. Gupta continues to 'guide' the students of Panjab University and desecrate the chair in the Geology Department of the University, unmindful of the national and international furore. The team from Geological Survey of India, after a visit to some of the sites, documented its findings and published the same in the *Indian Minerals*—the organ of the GSI, clearly proving the falsification of facts attempted by Gupta. The Society

for Scientific Values, the Teachers' Association of Panjab University, the Geological Society of India and the national newspapers have insisted, in the interest of scientific values and integrity of scientific community, that action should be initiated against Gupta. It is amazing that the Panjab University has chosen to ignore all the scientific and legal opinions. To cap it all, the University has now turned its uncalled-for attention on some of the co-authors who had shown courage of conviction to speak the truth about Gupta's fraudulent researches. The Gujral Commission of enquiry did not find any of the co-authors guilty of any malpractice. However, the Panjab University has chosen to punish A. D. Ahluwalia of the Geology Department. Such a victimization of a courageous co-author should be checked or else, in future, no one with conscience will come forward to speak

the truth and the scientific community will be anaesthetized. It is time the Indian scientists wake up and act. They should not allow themselves to be the butt of international ridicule and contempt. It is time a concerted action is initiated against Panjab University, by boycotting its examinations, meetings and any academic contact until it acts on Justice Gujral Commission findings and other scientific investigations against Gupta. It is necessary in the interest of fair play and scientific truth to protect Gupta's co-authors from victimization.

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## Vedic mathematics

The review of the two books on Ancient Indian Mathematics by C. S. Yogananda (*Curr. Sci.*, 1995, 69, 702–703) is in bad taste. The reviewer, more than commenting on the contents of the books, shows interest in announcing that he is in the bandwagon of critics of *Vedic Mathematics* of Bharati Krishna Tirtha and in musing how mathematics should have been developed in India in post-Greek period. As regards the term 'Vedic' in the title of his book the Tirtha himself has given an explanation citing the words like *Ayurveda*, *Dhanurveda*, etc. Again, the absence of the ideas of Vedic Mathematics in the sources with which the reviewer is acquainted (many of us are not even aware of what exists in the oriental libraries and the traditional households in India and have neither the interest nor the competence to study them) does not mean that the ideas are/were not in a *pariśiṣṭa* of Atharva Veda as claimed by the Tirtha. Jhunjhunwala of Indian Institute of Technology, Madras, has pointed out in one of his publications that a carpenter was aware of and used

one of the *sūtras* of the Tirtha to point out that a tradition was there, which presumably started from the Atharva Veda. The basic assumption that the printed texts available now of the Vedas is complete is again questionable. Several ancient and medieval works in Tamil, for instance, which are mentioned in later works now available, have been lost.

Yogananda and many other mathematicians seem to have their own view of what is mathematics. Mathematics, from its history, is a means of quantification. Quantification leads to computation. Conceptual ideas like measure, homeomorphism, etc. are abstractions of quantification. The part of mathematics which Yogananda and others hail as great also wants invariant quantifiers: Betti numbers, class numbers, etc. It was no surprise that ancient and medieval Indians concentrated on computation. Most of modern mathematics started from other branches based on utility. For instance, Fourier analysis. Thereafter to pass their own time with what they were capable of, mathematicians have abstracted the ideas.

However, a mathematician who does abstract differential geometry wants to highlight the importance of his topic (*not* their results!) by telling the world that physicists use their subject. In fact, if the Indians had been original and continued the work of their ancestors with their own originality, Indian mathematicians would have challenged the supercomputer and would have used fuzzy logic everywhere making the entire world look in amazement. Tinkering with western ideas and building empires has been the sole capability of Indian scientists!

The reviewer betrays his ignorance in many of his statements. *Yuktibhāṣa*, a work of Jyēṣṭadeva, contains arguments establishing results which are acceptable to keen students like D. T. Whiteside (the reliable editor of Isaac Newton's mathematical papers). Is this not deductive logic? That  $\pi$  is irrational was succinctly stated by Nilakanta in his *Āryabhaṭīya bhāṣyam*: There will never be commensurability for both the diameter and circumference. Irrationality was known

even during Śulvasutra period. Ideas of Calculus (e.g.  $d(\sin \theta) = \cos \theta d\theta$ ) are germane in Āryabhata's work.

What is wrong in calling Pell's equation as Brahmagupta–Bhāskara equation if the latter have considered these equations earlier to Pell?

It is too much to say that the popularity of Vedic mathematics would endanger mathematics education. Introduction of abstraction in mathematics right from undergraduate level has already killed the subject. It has even been pushed to school level with disastrous consequences. Almost all students, research scholars, teachers and researchers can reel off definitions and theorems but can never construct an example. Mathematics is no more enjoyable as it was found 30, 40 years ago. On the other hand, children do find the algorithms of Vedic mathematics highly enjoyable. They are able to work with them with ease. Which is dangerous: Memory-oriented learning of mathematics without concrete examples or computation with joy? We wish that mathematicians would desist from talking about what they do not know and assess whether they are capable of making what they deem as important, enjoyable and useful.

Finally, T. S. Bhanu Murthy certainly realized that the algorithms of the Tirtha could be mathematically justified while the reviewer speaks about the Tirtha's work without looking into what it is. Let scientists of the country become responsible to the nation and to its youngsters whose future they would spoil otherwise.

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from the claims made in that book, and also by its propagandists.

It is ridiculous to equate mathematics with algorithms to facilitate computation. Rangachari's statement that 'In fact, if the Indians had been original and continued the work of their ancestors with their own originality, Indian mathematicians would have challenged the supercomputer... making the entire world look in amazement' is the height of naivety. Mathematics is much more than mere computation. For instance, no supercomputer could have ever made the *Ramanujan Conjecture* or, even less so, proved it!

If, as he says, mathematics is no more enjoyable as it was found 30 or 40 years ago, the mistake does not lie with mathematics! Exciting things are always happening in mathematics. What better example than the recent proof of *Fermat's Last Theorem*!

C. S. YOGANANDA

*C. S. Yogananda replies:*

I stand by my comments regarding Vedic Mathematics of Sri Bharati Krishna Tirtha. My fear of possible negative influence of Vedic Mathematics on education stems

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## RESEARCH NEWS

### Crucial role of the landscape 'matrix' in determining biodiversity within fragmented habitats

*Neelkamal Rastogi*

Extensive urban and agricultural developments have caused major changes in the landscape patterns. Human activities in the form of commercial and industrial enterprises, construction of residential complexes and network of roads have brought about fragmentation of natural landcover types, such as forests or grasslands. Although all natural landscapes can be considered as mosaics since they are composed of discrete bounded patches of biotic and abiotic structure, human-caused ecological disturbances have played a particularly prominent role in altering the

landscape patterns. All landscapes are characterized by a predominant continuous cover type which acts as a 'matrix' in which other patch types appear. For instance in human-dominated landscapes, forest patches may be embedded in a 'matrix' of farm fields or human settlements.

In the mid-1980s, Larry Harris, an ecologist at Florida State University published *The Fragmented Forest*, an influential book which argued that human settlements, especially the roads accompanying it, split natural areas into small isolated

pieces which in turn led to ecological impoverishment<sup>1</sup>. In view of the detrimental effect of habitat fragmentation on biological diversity, ecologists in various parts of the world are trying to prevent fragmentation of threatened habitats<sup>1,2</sup>. However, till now it was not exactly clear how the fragmented landscape affected biological diversity. Recent experimental results clearly demonstrate the crucial role of the landscape 'matrix' variables in explaining variation in biodiversity within protected but fragmented habitats<sup>3,4</sup>. Between 1949 and 1987 a