

## Improving research with spiritual 'Karma'

A lot has been said in these columns about the poor quality of research and poor impact factor of the journals of our country<sup>1</sup>. Suggestions made for the improvement of the former are more or less patch work-like which do not strike at the root of the problem and for the latter they are merely theoretical. I wish to give some realistic solutions for improving the situation, whatever be the general facilities of library, laboratory and technical man-power available.

The best way to improve the working of young researchers is to make helpful and constructive criticism and suggestions during the presentations they make at conferences and encourage them to interact even after their presentation, which should culminate in correspondence after the conference. Several teachers and students, especially from central and south India, used to write to me regularly about their problems, some occasionally sending me their manuscripts for a pre-review before submitting them to the journals for publication. This interaction benefited not only the young workers, but it also gave me an opportunity to improve my understanding of dynamic processes. If one is serious and sincere this could prove to be a two-way process to benefit both.

In order to provide current literature to the workers in the field of kinetics and mechanism, an Association of Kineticists of India was formed in 1978 at Jaipur and a bulletin was published three times in a year, giving all the titles of publications of kinetics and mechanism, taken from *Current Contents*. This was of great help to those workers who had no access to *Chemical Abstracts* and other journals.

Indifference of the competent and senior workers towards contributing their research papers for publication in Indian journals has been considered to be one big reason for the journals going sub-standard, but it is only partially true, because there are not many competent and sincere reviewers too. Lack of impact factor and recognition may dissuade competent workers not to contribute, but there is one great advantage in making publications in prestigious foreign journals, since one gets an opportunity to learn more about the subject from the comments of the referees – a feature which is conspicuously absent in the Indian scene. Whatever be the review here in India for Indian journals, it is incomplete, unexhaustive, sometimes vague, less suggestive and less helpful to the authors. It is here at least that the competent reviewers can do the job with a mis-

sion to raise the standard of the journals. This would automatically improve the quality of the work too. While reviewing the papers for Indian journals, the reviewer may have to write comments often running into two to three pages, which one should do to do one's bit to improve the research.

Thus one has to look at the problem in a slightly spiritual way. In doing so, one does one's duty of 'Karma' individually, leading to collective effort which not only improves the situation in research, but also promotes brotherhood, harmony and emotional integration amongst various parts of the country.

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Y. K. GUPTA

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

## Lessons from Seattle (USA) earthquake of 28 February 2001

Recognizing the seismic hazards that crustal faults and sedimentary basins can pose to Seattle (Washington, USA), the US Geological Survey and its collaborators initiated a series of urban seismic studies of the upper crust to properly map seismogenic structures and sedimentary basins in Seattle and its surroundings<sup>1</sup>. These studies and those that were carried out earlier during 1960s and 1970s have enabled the architects to build structures following a uniform building code designed to withstand strong earthquakes. Because of this a 6.8 magnitude earthquake (28 February 2001) centred about 35 miles south-west of Seattle, whose impact was felt as far away as Salt Lake

City, Utah and parts of Vancouver in western Canada and downtown Portland, Oregon has not created any major structural damage to the buildings, resulting in practically no loss of life. Even though the killer earthquake of Kachchh was of much higher magnitude, viz. 7.8, the large-scale damage to even buildings in Ahmedabad (which is more than 400 km from the epicentre) clearly indicates that we in India have to develop region-specific building codes to minimize the destruction and loss to the property and life.

I have already clearly shown the similarities between West Bengal (India) and Seattle (USA) basins and suggested the

need for understanding the geometry of the West Bengal basin in an earlier article<sup>2</sup>. The uppermost low velocity quaternary deposits of both the basins help in considerably enhancing seismic wave propagation, resulting in amplified surficial vibrations. Apart from West Bengal basin (which to a major extent is aseismic), we do have similar geologic conditions in Indo-Gangetic plains, Mahanadi basin and to an extent even in the Godavari graben. So, keeping in view the positive result of the systematic scientific investigations in Seattle basin for the last two to three decades, it is suggested that we need to launch specific scientific programmes for understanding the finer

details of the geometry of different basins, as there is a proven correlation between the geometry of the basins filled with sediments and the amount of amplification of the seismic waves. This would not only help in better micro seismic zonation of different regions, but also clearly help in evolving region-specific building codes that would help us to build earthquake-resistant structures, specially in known seismic active zones.

This aspect should be seriously considered while developing building codes. So, the expert panel that is entrusted with the responsibility of developing a building code for different regions as a post-Kachchh disaster preparedness programme, should take this into consideration, instead

of concentrating only on superficial structural details, soil characteristics, etc.

The other important lessons that need to be learnt from this Seattle earthquake are:

(1) Short range prediction is still beyond our grasp. (2) As every continental segment has significant lateral subsurface structural variations, the felt effects of seismic energy generated by earthquakes vary from place to place, depending on the source characteristics and source-receiver media. (3) Studies need to be initiated to understand the reasons for (a) swaying of buildings in downtown Portland 300 miles away from the Seattle epicentre and little effect in Vancouver

which is relatively nearer; (b) relatively no effect was felt in Hyderabad during the Kachchh earthquake, whereas vibrations were felt in Chennai, which is much further away.

1. Broacher, T. M. *et al.*, *EOS Trans. Am. Geophys. Union*, 2000, **81**, 545–552.
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P. R. REDDY

National Geophysical Research Institute,  
Uppal Road,  
Hyderabad 500 007, India  
e-mail: postmast@csnagri.ren.nic.in

## NEWS

### What's in the Union Budget 2001–2002 for S&T?

Business and Industry in India are generally euphoric over the Finance Minister's Union Budget Speech of 2001–2002, felt by and large, as conducive to the growth of the economy. Against this backdrop, comes allocation for S&T. What's in it for S&T?

As far as budget estimates in 2001–2002 for the Ministry of Science and Technology are concerned, an overall increase of about 11% is 'in line with earlier years'. The overall R&D expenditure is estimated to have moved from 0.87 to 0.90% during 2000–2001 to 2001–2002. S&T outlay for six Central S&T Departments/Agencies from 1990–1991 to 1999–2000 is shown in Figure 1. Selected budget estimates of Central Plan Outlay for certain ministries and departments for 2000–2001 and 2001–2002 are given in Table 1.

R. A. Mashelkar, Secretary, Department of Scientific and Industrial Research (DSIR) and Director General, Council of Scientific and Industrial Research (CSIR) when contacted was happy that the new initiatives launched last year such as the New Millennium Indian Technology Leadership Initiative (NMITLI) of CSIR continues into this financial year with an allocation of Rs 50 crore. The CSIR, he said, would have a bigger network programme with

focus on bioactive materials (Rs 47 crore) and SARAS light combat aircraft (Rs 137 crore) as major gainers. The success of 'Team CSIR' would be extended towards 'Team India', he added. The Indian Millennium 2020 Mission of the Technology information, Forecasting and Assessment Council (TiFAC) also receives Rs 50 crore as continued support for its initiative last year.

Additional allocations are for fundamental research (Rs 10 crore) to the Scientific Engineering Research Council (SERC) of the Department of Science

and Technology (DST). Rs 14 crore for boosting infrastructure on S&T in universities and institutions of higher learning (FIST) and more funds (Rs 20 crore) for weather prediction ability such as Doppler radar, etc. and Seismology Risk Assessment of the India Meteorological Department. V. S. Ramamurthy, Secretary, Department of Science and Technology said, 'basic research was slowly getting eroded but the increase in well-defined and targeted funds, for boosting fundamental research, was encouraging'.

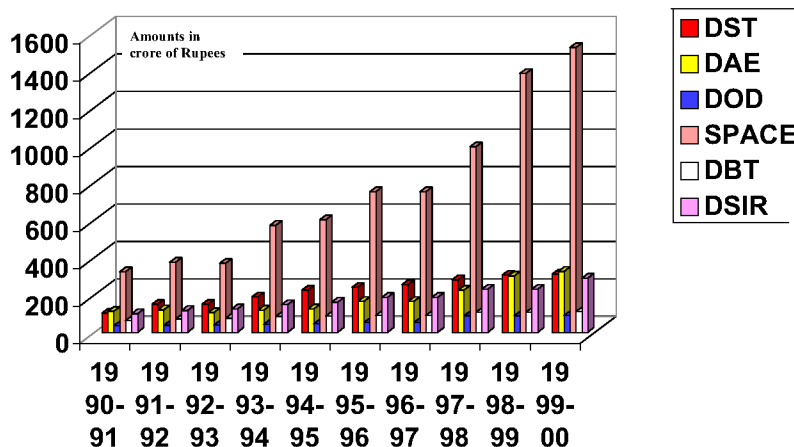


Figure 1. S&T Plan outlay from 1990–1991 to 1999–2000 for six Central S&T Departments/Agencies (Source: DST).