A case of plagiarism

Reports are now available about one more case of plagiarism allegedly by B. S. Rajput, a professor of Physics and at present the Vice Chancellor of Kumaun University. Information regarding the nature and extent of the said case of plagiarism is available on web (http://www.geocities.com/physics_plagiarism).

Scientific misconduct and fraudulent research is perhaps not as rare as some of us would like to believe. Unlike the corrupt practices in other areas of human activity, research frauds often remain undisclosed. In other areas, investigating agencies are usually entrusted with the responsibility of uncovering cases of corruption. Moreover, there are often such party or parties whose interests are damaged by such cases. But in the field of research, individuals are not generally harmed, although science *per se* gets hurt. Foul practices come to light only when the results of a research work turn out to be unusually significant and draw the attention of other scientists eager to reproduce or to verify the results as happened in the case of a recently reported discovery of nuclear element 118 (*Phys. World*, August 2002, p. 7). Sometimes personal hostility between two parties may also lead to a revelation of unfair means being practised. Otherwise cases of research reporting based on stolen work, cooked data or manipulated analysis, etc., remain generally covered.

The spirit of inquiry and the thrill of having discovered the mysteries of nature are no more the motivating factors in present-day scientific pursuit in many cases. In our own country, traditional social values are rapidly vanishing and professional success is becoming the sole motto of life. Every human activity has now become a competitive game to be won by the participant at any cost. The goal is now what matters rather than the quality of the means to achieve it.

Since award of research fellowships and grants and university-level appointments and promotions are based practically on the list of publications and Ph D's, it is no wonder that some of us get prompted to enlarge that list by fair means or foul, to attain quicker success or to emerge winner in the present day tough competitive world. Of course extraneous factors like developing connections with those involved in academic management and policy-making have their own importance.

Scientific misconduct sometimes assumes very subtle form. For example, some scientists/teachers do not hesitate in seeing their names in publications to which their contribution is naught. When Rajput says '...several groups working under his guidance in various universities were including his name in their papers, most of the time without his knowledge or consent...' he really means that in the field of research, it is not an uncommon practice for the juniors to put in research papers names of senior scientists/teachers to win the latter's favours. It seems seniors do not object to this practice, otherwise this practice would have been absent. They do indeed claim their innocence when some controversy takes place.

There is perhaps no cure to this sort of social ailment. In certain cases, one's own inner voice does the policing and stops one from resorting to unfair means. In the past, most people avoided committing wrongs since these would cause embarrassment and would invite accusing fingers. Unfortunately in the present social milieu, these two moral deterrents are getting weak, and more and more people are now learning how to present defiantly a brave face to others and justify wrongs with all sorts of essentially untenable arguments. A punitive action is rarely taken by a competent authority against one indulging in unethical activities. Withdrawal of the unduly acquired privileges or position is what may sometimes take place. But that is no punishment. Thus achieving professional success by foul means is becoming a profit-at-no-risk business.

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Right chemistry

Subsequent to the editorial (*Curr. Sci.*, 2002, **83**, 1177), some points need further deliberation.

There is a problem of image with chemistry, but the conclusion that the greatest blow to experimental chemistry, has been dealt by overemphasis on computational and theoretical chemistry, as forewarned by you 'and my prejudice must show', is just that – a result of a very prejudiced view. Beyond the prejudice, chemists at large should do some soul-searching to find answers, instead of finding fault with computational and theoretical chemists who are trying to do what they can, in their chosen field.

You mention that our major institutions abound with theoreticians. This certainly does not seem to be so with respect to theoretical and computational chemists. Numbers do not support this. On the average, less than 10% of the faculty members of any given chemistry department belongs to theoretical and computational chemistry. The largest I found is 20%, but half the chemistry departments in the country do not have even one.

There are several factors to be considered. I remember lengthy conversations and arguments amongst several of us, almost 25 years ago, about starting an academic career in India. Most experimentalists did not want to take the option as they thought the task of setting up an experimental lab here is herculean. Many of them are doing well in academic research in respectable universities in the US. The message that it is possible to set up and run an experimental chemistry research lab must be sent out to everyone and must be followed by making it a

reality in a large scale all over the country.

It appears that the realization that computational chemistry is important to experimental chemists is yet to be taken note of. An examination of the research articles from the best experimental groups around the world shows that a good number of them also discuss their results along with theoretical calculations. The reluctance of using computational methods to help experimental studies reminds one of the disdain expressed by many chemists when NMR came as an operational machine. Solving a molecular structure by IR and NMR was termed as 'cheating' by some classical chemists. But soon they adopted NMR machines as an unavoidable part of a chemical laboratory. Similarly, many outstanding chemists abroad have adopted computational methods as unavoidable tools. It is perhaps just beginning here. There are many other reasons to use computational and theoretical methods to do chemistry which are not elaborated here.

I do not regard chemistry as mundane. We concede much as physics and biology. Instead of blaming theoretical chemistry, physics, or biology, chemists should be bringing out dramatically the molecular origin of everything, including life and death, biomaterials and nanoscience and everything else that has slipped away from chemists, but is chemistry.

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Milestones in schizophrenia research

How are abnormalities in disparate brain regions related to each other in order to contribute to the clinical phenomenon of schizophrenia? This question asked by Rao (*Curr. Sci.*, 2002, **83**, 1183), is a million-dollar question, which if answered, will bring a ray of hope to all the patients worldwide. Though cell bodies in the brain stem and midbrain (tegmentum) that project widely to the cerebral cortex and forebrain limbic system (entorhinal cortex), are thought to be involved in schizophrenia (*The Brain: A Neuroscience Primer*, second edition, p. 133), a clear-cut functional and structural involvement still needs to be elucidated. The brain bank facility started at NIMHANS, Bangalore, jointly funded by DST, DBT, ICMR and NIMHANS, is a big leap in this direction (Sen, Nirupa, *Curr. Sci.*, 2002, **83**, 544–545). Due to genetic and phenotypic heterogeneity underlying this disease, the genotypic studies have been inconsistent. But schizophrenic and control brain samples can be effectively utilized to study the gene expression and finally to aim at all the culprit genes in the Indian population. One such study, carried out by Mental Health Research Institute, Australia, has already identified 153 genes affected by schizophrenia.

What we require today, is a complete understanding of the pathogenicity of schizophrenia. The brain bank facility is definitely going to come in handy for this purpose.

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Botany students must help in the conservation of plants

Shekhar Banerjee's appeal to botanists to 'think'[1] is a necessary reminder. Way back in 1991, I had expressed my views against the need to collect 'important' plant species by each botany student, for submission of a herbarium[2], citing examples of *Isoetes*, *Osmunda*, *Ophioglossum*, pitchers, etc. that were vanishing from their natural habitats. Some statistics was also attempted to show that literally lakhs of flowering twigs were destroyed by graduate and postgraduate students of botany all over the country, every year, for the exercise of preservation of plants which should be actually conserved by them. Some university teachers wrote to me that they had confined herbarium activity to only weedy species, while some discouraged students by giving negative marks for herbaria containing 'rare' species. Banerjee's letter however, shows that the academic situation has hardly changed since the eighties of the last century, and that there is little concern for the rapid disintegration of natural biota.

To a great extent, I would blame our teaching fraternity who (a) are generally indifferent to the seriousness of the problem of vanishing species, (b) follow out-dated methods of evaluation of students' performance, and (c) are not careful about informing students (due to ignorance/lethargy) about the importance of every small step in the major effort of conservation. Such an attitude permits field tours to degenerate into 'collection cum sight-seeing picnics'.

I am directly and indirectly associated with some environmental education programmes conducted for school children and general public in which students and