Original Sins

Lack of Integrity in R&D

By J V Narlikar

A visitor to the Bell Labs in Murray Hills, New Jersey, will see an impressive array of photographs depicting the highlights of research carried out within its portals. One sees here Nobel laureates and experiments that have become textbook material for the new generation as well as leading to pioneering applications in industry.

Two examples in astronomical research may be mentioned. The field of radio astronomy owes its origin to the researches of Karl Jansky at Bell Labs, some seven decades ago. In 1965, Arno Penzias and Robert Wilson at the Bell Labs made the serendipitous but profound discovery of cosmic background radiation that gave a fresh turn to modern work on cosmology.

Against such a seminal background, the scientific world was shocked a few weeks ago, to read of the case at Bell Labs, wherein a bright young scientist with a promising research career ahead of him admitted using fabricated data in order to substantiate a result which would have had tremendous implications. The work, co-authored by a team of scientists, had been published in the prestigious journal *Nature*. A committee of experts set up to investigate the episode placed all the blame and responsibility of fraud on one member of the team and exonerated the others.

Fabricating data, in this case, included cutting and pasting one part of an experimental curve onto another and placing imaginary points to extend the curves, when there existed no real data to support the hypothesis. The work was in the growing field of molecular electronics which is expected to be the next stage in the advances towards nano-technology, in the process of transmitting information with transistors the size of molecules.

Faking data is not a phenomenon of recent origin, but has dogged the onward march of science through the ages. A historic and classic example of this kind was that of the French physicist R Blondlot, professor and head of the department of physics at the University of Nancy and a distinguished member of the French Academy. He announced in 1903, the discovery of a new kind of rays which he named 'N-rays', and which seemed to be even more remarkable than the X-rays discovered by Roentgen in Germany in 1895. For example, it was claimed that if the N-rays fell on the eye, they increased its ability to see objects in the dark. With the traditional Franco-German rivalry extending to science also, this discovery was greatly publicised in France and the French Academy bestowed its gold medal and the Lalande prize on professor Blondlot.

Twelve papers elucidating the remarkable properties of the N-rays were published in one year in the leading French journal *Comptes Rendus*. However, scientists in neighbouring Britain and Germany could not replicate any of the results on the N-rays and this led to a growing suspicion as to whether they were genuine. These scientists were aware that they would not be welcome to inspect Blondlot's lab, as they were considered rivals. So they persuaded the famous experimental physicist R W Wood from a 'neutral' country, the US, to probe the matter. Wood has written a graphic account of how he went to Blondlot's lab and was able to uncover the fraud. Put simply, the N-rays did not exist.

Just as faked data is the main source of malpractice in experimental science, plagiarism is the bane of its theoretical counterpart. For, in a theory paper, the main thrust is on the logical sequence of arguments backed by quantitative equations.

Of course, the plagiariser can make a defence that he thought of the idea independently. Indeed it does happen once in a while that one scientist thinks of a theory unaware of the fact that another has already published work on it. However, in such cases one does not find word-for-word correspondence that is typical of plagiarised work.

IN BRIEF

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While condemning such malpractices, one can ask, what is it that motivates a scientist to indulge in them? In modern times, the pressure to publish papers of good quality can force even a good scientist, as in the Bell Labs case, to take unethical short-cuts. If promotion of a scientist is decided by counting his publications, or if his election to a scientific peer-body depends on his manifest creativity, then there is a temptation to inflate his list of publications with a few bogus ones.

Another unethical practice common in most countries, but perhaps more so in India, is the tendency of the research supervisor to put his name as a co-author of the paper based on his pupil's work, to which he has made no contribution. To what extent is a co-author responsible for the paper's contents? In this context, the fact that the investigation committee exonerated the rest of the authors in the Bell Labs case tells us that these co-authors had not gone into the details of how the data used in the paper was obtained. Should this not be treated as a lapse?

Similarly, can one author of a plagiarised paper get away with the defence that his co-author had done it without his knowledge? Hardly so. For once you put your name down as one of the authors of a paper, you should be held responsible for it just as you also deserve a share in its credit.