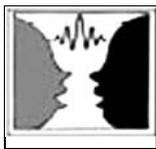


Face to Face



This section features conversations with personalities related to science, highlighting the factors and circumstances that guided them in making the career choice to be a scientist.

On Research Misconduct

*Hari Sridhar talks to Vidyanand Nanjundiah**

Hari Sridhar talks to Vidyanand Nanjundiah, formerly at the Indian Institute of Science and now professor at the Centre for Human Genetics, about the rise in research misconduct and what we should be doing about it.

After completing a PhD in Physics in 1972, Vidyanand Nanjundiah shifted to research in developmental and evolutionary biology. The major part of his career was spent in the Indian Institute of Science, Bengaluru, where he worked on communication and social behaviour in the cellular slime moulds. After retirement he has joined the Centre for Human Genetics, Bengaluru, as honorary professor. He was associated with *Journal of Biosciences* from 1991 to 2009, for the last ten years as editor. The experience reawakened his interest in ethical issues related to scientific research and publication.

Hari Sridhar (HS): How and when did you get interested in issues related to scientific misconduct? Was it triggered by a particular incident?

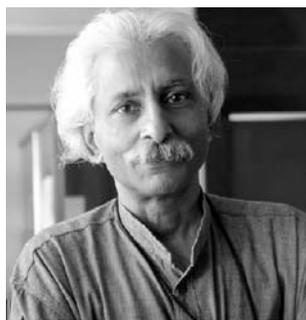
Vidyanand Nanjundiah (VN): I grew up with the belief that science was a peculiarly ethical enterprise; fabrication, falsification or plagiarism – the most frequently discussed forms of misconduct – would be practically unknown among scientists. If they occurred at all, they would not mislead others for long, thanks to the supposed self-correcting mechanisms of science.

When in college, I came to learn that things were not always like this. Reading about the Pilttdown Man hoax [1] made an impression. Many years later, the book *Betrayers of Truth* [2]

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<https://indiabioscience.org/columns/conversations/on-research-misconduct-an-interview-with-vidyanand-nanjundiah>





Vidyanand Nanjundiah

forcefully brought home the point that doing science often turns into an occupation like any other. As journal editor, I attended a conference on scientific ethics. That is when the long provenance of scientific misconduct and its worldwide prevalence became apparent to me. One sensed that as much as ideals, scientists too were motivated by considerations of personal gain, status, etc. Scientific misconduct did occur, as a means to some other end.

Having said that, it is probably true that there is significantly less misconduct in the practice of science than in other human endeavours; not that that is any consolation. One reason behind the amount of talk about it is that it is –

fortunately – considered an aberration. People are horrified by scientific misconduct in a way that they are not when they hear of misconduct among politicians, say.

HS: In a 2008 editorial in the *Journal of Biosciences* [3], Dr. Mukunda and you speak of three forms of misconduct in science-fabrication, falsification and plagiarism. Do you think all three forms are on the rise?

VN: Certainly the perceived extent of misconduct is on the rise. One hears a lot more of plagiarism than fabrication or falsification, but the latter two are also harder to detect. There are other sorts of misconduct too, for example those involving conflicts of interest. They seem to be more common than before, in science as in other areas. A blatant instance would be to submit a grant application and also serve on the committee that evaluates it.

HS: Could the perception that plagiarism is rising be, at least partially, due to our being able to detect it better?

VN: Yes, it could. The Internet plays two roles here. The huge number of scientific papers being published and easy online access to others' work must make it easier for people to be tempted to copy from others. The enormous amount of material available affords a reasonable expectation of escaping detection. On the other hand there are increasingly sophisticated tools available for spotting plagiarism and more cases get found out than before.

HS: What could be causing a rise in scientific misconduct?

VN: The perceived rise in scientific misconduct has gone in parallel with the remarkable expansion in the population of scientists in the second half of the 20th century, the emergence of science as an activity performed by large groups, the increase in public funding for research (as opposed to teaching) and the role played by public acclaim in influencing the view that sci-



entists and institutions have of themselves. As a consequence of these factors, there is intense competition for employment in places that offer a suitable research environment. Then there is the fact that the standards for assessing achievement today – not only in the natural sciences – emphasise quantity over quality. Norms that rely on numbers are easier to subvert than those that make use of old-fashioned criteria such as reading publications and leaning on the opinion of knowledgeable people. Management and public relations skills gain importance. The temptation to cut corners rises; worse, one can remain oblivious of the fact that one is doing something improper. Sheer curiosity, which should be the main reason for doing science, soon gets stifled.

School pupils have long carried out ‘cut and paste’ operations with the help of newspapers and other printed materials for doing homework assignments. As often as not, it is their parents who do so, adding a layer of socially sanctioned misconduct. The Internet lends itself to be viewed as a gigantic newspaper from which one can cut snippets to make up a pasteboard story. It is assumed to be as permissible as using calculus and not citing Newton and Leibniz – which no one does of course.

HS: Do you think some of these could be cases of ‘honest mistakes’, self-plagiarism, for example?

VN: Self-plagiarism is a problem. It can take place for a trivial reason. When you follow a standard procedure in experiments, it is difficult to come up each time with substantially different descriptions of what you have done. But it can also involve the presentation of previously published findings or analysis as new, as part of an effort to make your publication record more impressive than it really is. That is serious.

HS: Can journals do more to tackle scientific misconduct? Can you tell us a little about what the Indian Academy of Sciences (IAS) has done in this regard?

VN: Many journals have been doing what they can. Some routinely put texts and images through software that can check for plagiarism or manipulation. The volume of submissions is making this an increasingly difficult measure to implement. Reviewers are overwhelmed by requests to assess data-heavy manuscripts within ridiculously short times. That opens the field for more dubious journals that offer quick publication with little or no oversight.

In the editorial you referred to [3], IAS assured that “every case of suspected plagiarism” in its journals would be “investigated objectively and transparently by the journal editors as speedily as possible” and “steps [would be taken] commensurate with the seriousness of the case”.

If plagiarism was demonstrable, the Academy could take more than one course of action – including rejecting the paper and “bring[ing] such instances to the attention of the author’s



employers, funding agencies and (where applicable) the original author whose work has been plagiarised”. One paper had to be withdrawn after publication during my time as editor of *Journal of Biosciences* and there were cases in which submissions were turned down because parts of them were plagiarised.

HS: Can institutions do more to counter scientific misconduct? Again, can you tell us a little about what IAS has done in this regard?

VN: The head of a research group should take the lead. Unfortunately, group heads tend to be so driven by the desire to publish that sometimes they look the other way when there is a lapse in ethical behaviour – or worse, instigate it. IAS has set up a ‘Panel on Scientific Values’ to monitor lapses in scientific ethics, but only lapses committed by a Fellow, and that too if a complaint is made. After examining a case, it presents its report to the Council of the Academy along with recommendations for action. It is left to the Council to decide on what to do. Removal from the Fellowship would appear to be the most extreme penalty that can be imposed. I wonder whether the existence of the Panel has led to an increase in ethical behaviour among Fellows.

HS: What about at the policy level? Is there a need for an ‘office of research integrity’, like in the US?

VN: An ‘office of research integrity’ would be a useful regulator if it functions fairly. But your question touches on something that goes beyond misconduct in science. Policing and punishment can be effective when a society is reasonably homogeneous and cohesive, and most people accept most restrictions most of the time. If a society is riven by inequalities, as ours is, rules are often made by one set of people and enforced on another. The situation is tailor-made for fostering the notion that the system is unfair, and that could extend to opinions on how the regulatory body functions. This line of thinking may appear irrelevant in the context of science. On the other hand, factors such as the prestige associated with the ranking of universities and research institutions, the pressure to boost them and the way in which funds are allocated, suggest otherwise.

Non-official bodies such as the Society for Scientific Values [4] and Retraction Watch [5] might be more effective. But journals and people in positions of authority are notoriously reluctant to respond to complaints. So this route may not be all that successful either, because at most it can lead to shaming the individual (if that).

Depressing as it sounds, the combination of a regulatory body and more than one independent watchdog may work best.

HS: What advice would you give young faculty in Indian universities and institutes with regard



to research misconduct?

VN: The pressure to ‘perform’ is most intense on junior faculty, especially when they are on probation. A young colleague told me recently that his university expects him to publish at least seven papers in five years during the pre-tenure period. This is a silly way to assess a scientist, because it does not pay attention to the quality of research, not to speak of other socially valuable activities such as teaching, communicating with the wider public, reviewing others’ papers and so on. It falls on institution leaders and department heads to protect young faculty from unrealistic expectations and help them retain a sense of self-confidence.

HS: What steps should a ‘victim’ of plagiarism take?

VN: After getting the facts straight, the first thing should be to write to the suspected plagiarist and ask for restitution. If that does not work, one should write to a potential adjudicating authority (head of department, vice-chancellor, journal, society). Legal redress is always available as the last resort. Much depends, however, on direction and leadership within the scientific community. The Society for Scientific Values has been open and forthright, but one has the impression that the bulk of the community is holding itself aloof from it.

HS: What role does culture play in these issues?

VN: As far as India is concerned, modern science is one of many imported cultural traits. But we tend to think of it as a universal pursuit that has freed itself from cultural moorings. Science in India (and for that matter in other non-Western countries) conforms to that view only in part, because our actions are influenced more by people than by rules or impersonal facts. M K Chandrashekar described one aspect of the problem as ‘mutual approval of mediocrity and unethical reciprocity’ [6]. It would be a worthwhile exercise to study the confrontation between norms of functioning expected in modern science and in our daily lives. *Uncommon Sense* by Alan Cromer [7], *The Twice-born* by Morris Carstairs [8], and *The Indian Half of Needham’s Question* by R Narasimha [9] contain interesting speculations.

HS: Many journals are now making it mandatory for authors to make raw data available. Do you think this is a step in the right direction, with regard to tackling misconduct?

VN: This would make falsification or fabrication more difficult, but a clever worker could anticipate potential problems by fixing the raw data too. Some laboratories require that work records be signed and dated at the end of each day. The intention is to guard against false claims that may be made much later. Others monitor research continuously with the help of CCTV cameras. In my view such steps will only increase the incidence of creative subterfuge. More importantly, if this is what doing science amounts to, why not go in for investment banking instead?



Suggested Reading

- [1] <http://www.nhm.ac.uk/nature-online/science-of-naturalhistory/the-scientific-process/piltdown-man-hoax/>
 - [2] https://en.wikipedia.org/wiki/Betrayers_of_the_Truth
 - [3] <http://www.ias.ac.in/jbiosci/jun2008/i.pdf>
 - [4] <http://www.scientificvalues.org/>
 - [5] <http://retractionwatch.com/>
 - [6] http://www-old.ias.ac.in/j_archive/jbiosci/16/1&2/editorial1991.pdf
 - [7] <https://global.oup.com/academic/product/uncommon-sense-9780195096361?cc=in%E2%8C%A9=en&>
 - [8] <http://www.amazon.com/The-Twice-Born-G-Morris-Carstairs/dp/025320108X>
 - [9] <http://www.maneyonline.com/doi/abs/10.1179/030801803225010340>
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