The time is right to confront misconduct

After a generation of denial, research leaders are finally treating scientific fraud with the seriousness it deserves, says **Colin Macilwain**.

One problem with having worked as a journalist for a long time is that every story comes with a feeling of déjà vu. You keep thinking: I've been here before. So it is refreshing to report one issue where something has actually changed: the vexed and perennial problem of research misconduct, which scientific leaders are finally taking seriously. Talking to several leaders in recent weeks, I have found that their mood has hardened — and not before time.

For too long, scientists' instinctive defensiveness has produced general denial that misconduct constitutes a serious problem.

I arrived in Washington DC to work for *Nature* in 1993, in the aftermath of congressional hearings into allegations of misconduct involving a paper by biologists David Baltimore and Thereza Imanishi-Kari at the Massachusetts Institute of Technology in Cambridge. The researchers were correctly found innocent. But the case led an independent commission chaired by reproductive biologist Kenneth Ryan to call for a much more rigorous approach to the investigation of misconduct.

Ryan was shot down in flames by scientific officials and his recommendations were ignored. They were delivered to the US Department of Health and Human Services, which kicked them upstairs to the White House. The administration of then-president Bill Clinton sat on the findings until 2000, when it issued a bland federal misconduct decree. And that was in the United States — the world's dominant scientific power and the one that had done the most to address misconduct.

Countermeasures elsewhere have been even feebler. In Germany, for example, no university had an integrity officer until 2011, and it is still difficult for institutions there to sanction proven fraudsters. Some judges consider academic freedom of expression to be paramount — and say that it would be violated if a university were to request scientists to retract a paper.

Worldwide, however, research integrity is now very much in the spotlight. Prominent cases in the United Kingdom, South Korea, the Netherlands and Canada in recent years have each had a disturbing and powerful impact in their respective locales.

Considerable hard data have emerged on the scale of misconduct. A metastudy (D. Fanelli *PLoS ONE* **4,** e5738; 2009) and a detailed screening of all images in papers accepted by *The Journal of Cell Biology* (M. Rossner *The Scientist* **20 (3),** 24; 2006) each suggest that roughly 1% of published papers are fraudulent. That would be about 20,000 papers worldwide each year.

At the time of the Baltimore case, it was widely argued that research misconduct was insignificantly rare — and irrelevant to the progress of science, which would self-correct. Few senior scientists now believe that. They know that misconduct exists and that, unchecked, it can undermine public regard for science and scientists.

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Two major studies to be released in the next year reflect this shift in attitude. Significantly, they have been instigated by leading scientists. One study, by the InterAcademy Council, is looking at international aspects of misconduct. Sharp disparities in investigative procedures — and the lack of any such procedures, or responsible officials, at many institutions outside the United States — are problematic, given that an increasing proportion of research involves collaborators from more than one country.

Robbert Dijkgraaf, co-chairman of the InterAcademy Council, is one of the people leading the study. He hopes that, when its findings are released this year, governments and research agencies around the world will use them as a template to improve training and enforcement of good research conduct.

The second study, by the US National Academy of Sciences, will report in 2013. It is likely to call for far-reaching changes in how US agencies define and police misconduct. Since the 2000 decree, agencies have regarded only 'falsification, fabrication and plagiarism' as misconduct: the academy may call for this definition to be widened in line with an emerging global consensus to include most other sorts of unethical behaviour, such as falsely attributed authorship.

Last December, for example, Canada established a Tri-Agency Framework for the Responsible Conduct of Research at its main funding agencies. The framework oversees publicly and privately funded research and has a secretariat to support university misconduct investigations.

Britain is also finally taking some faltering steps to address the issue. In July, universities adopted a voluntary concordat that obliges them to investigate misconduct allegations. Some research leaders want to leave it at that but others, led by Michael Rawlins, chairman of the UK National Institute for Health and Clinical Excellence, demand further action to ensure that cases are properly investigated.

Current scientific leaders have the opportunity to take the initiative and stamp down hard on fraud. Next year's National Academy study won't use language as divisive as Ryan's, but it could usher in a more consistent US system to handle misconduct, which could percolate around the globe. The international report will help governments and agencies to pursue miscreants across borders. Together, the studies represent a historic opportunity to deal with what is, perhaps, the single most potent threat to science's prestige. ■

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