Science in Society: Dialogues and Scientific Responsibility
24–25 November 2008
Paris, France

1) Introduction

Good morning everyone. I am Jeremy Theobald and I'd like to thank Frédéric Sgard and Jean-Pierre Alix for inviting me to talk to you today at this prestigious conference. I am here representing the UK-registered charity, the Committee on Publication Ethics (COPE) of which I am Treasurer.

2) What COPE is

For those of you who have not heard of COPE, it started as a small group of medical journal editors who sought each other's advice on how to deal with publication misconduct. Ten years later, it has over 5000 member journals, with the entire catalogue of Elsevier, Wiley–Blackwell, Springer and Taylor & Francis signed up. COPE does not restrict itself to fraud, as defined by fabrication, falsification and plagiarism, but includes in its definition of misconduct authorship issues (gift, guest and ghost), undeclared conflicts of interest, unethical research and clinical malpractice, duplicate and redundant publication (including salami slicing), and reviewer and editor misconduct among others. COPE holds quarterly Forums at which anonymised cases of publication misconduct are discussed and advice is given. COPE publishes internationally respected guidelines on publication misconduct, and has a Code of Conduct for member journals and their editors. It has produced flowcharts of how to deal with publication misconduct, it funds research into misconduct and holds annual seminars in the UK and next year in the USA as well. More information is available on the website at publicationethics.org

3) Why am I here?

I have been asked to talk about scientific publication and the measures taken to limit fraud. Publication is integral to scientific research and has been since Philosophical Transactions of the Royal Society was first published in 1665. Publication is central to the scientific method. Drummond Rennie, Deputy Editor of JAMA, wrote in The Lancet: "Science does not exist until it is published". It is most usually by publication and subsequent discourse that fraud is discovered.

In my 7 years of working for COPE, I've heard very important scientists, including Nobel Laureates and knights of the British realm, say fraud occurs very seldom, and doesn't matter anyway because science is self-correcting. I think that's rubbish. It's a phenomenal waste of time and public money. If anything, its incidence is increasing owing to technology, the internet and the control-c and control-v commands.

4) Nature paper

Nature published a paper in 2005 in which several thousand US National Institute of Health-funded scientists were questioned anonymously about their scientific research and publication behaviour over the past three years. Major fraud was confined to less than 2% of respondents. Minor fraud ranged from 1 in 20 to 1 in 7, depending on the behaviour. This ranged from publishing the same data twice (5%) to dropping data points from an analysis based on gut instinct that they were wrong (15%).

5) What's the problem?

Nature has also published papers by Jan Hendrik Schön. The Lancet has published papers by Jon Sudbo. Science published papers by Woo Suk Whang. These are names of famous scientific fraudsters but there are probably many more who are unknown. The problem is that scientific publication is based on trust. There is a saying, 'In God we trust, all others must bring data.' The question is, can we trust their data? Sometimes, no.

6) It's peer review, stupid

The problem is that the method we use to decide to whether or not to publish papers, the peer-review system, is as Richard Smith, former Editor of the BMJ put it: expensive, slow, prone to bias, open to abuse, and useless at detecting fraud.

The BMJ published a paper in 2004 in which it tested how good it's reviewers were at spotting errors that had been introduced into articles they had been asked to review. They knew they were in an experiment yet, on average, they detected less than three out of nine major errors and less than one out of five of the minor errors. Part of the group underwent training, either a two-day course or an online self-assessment, and it made very little difference to the results when they were asked to review again.

7) What is being done?

First, there is a need for more research on publication misconduct so we can really find out how much is going on and of what type. COPE is partnering with CrossRef (the people who make DOIs), who have launched their CrossCheck service, to conduct research into plagiarism, as well as funding research from individuals into publication misconduct.

Other initiatives are that some of the bigger journals are far more suspicious of certain types of articles now. The Lancet for example has a red flag system in its peer review process to identify those papers that are 'too good to be true' to make sure they undergo more rigorous review.

Some journals chose to check for certain types of fraud. The Journal of Cell Biology scans for image manipulation. Mike Rossner, the journal's managing Editor, says that in the 5 years they have been checking images at Rockefeller University Press, they have seen no decline in the number of doctored images. Fraudulent manipulation has stayed the same but inappropriate manipulation if anything has increased.

Other efforts at raising the standard of publications include the Equator Network by promoting reporting guidelines such as CONSORT.

8) What ought to be done?

But what is most important is for every research institution and every university to have research integrity officers who conduct full and proper investigations when misconduct is suspected or reported, with stiff penalties for those who are found guilty. Many institutions still sweep allegations of fraud under the carpet.

Finally the most important action that should be taken against scientific fraud is education, education, education. Undergraduates need to be taught first principles about integrity, Guidelines need to be set out and adhered to on what constitutes acceptable research practice and what doesn't.

And that education wouldn't harm PhD students, post-graduates and senior members of staff as well.