

Who is accountable?

How the responsibilities of co-authors for a scientific paper's integrity could be made more explicit.

The two most notorious frauds of modern science, by the stem-cell biologist Woo Suk Hwang and the physicist Jan Hendrik Schön, both brought into question the responsibilities of co-authors in the oversight of their colleagues' work. But despite the concerns raised after these episodes, there remains a need for a clearer understanding, both within a collaboration and by readers of the eventual papers, of the various contributions made by the authors not only to the research but also to safeguarding its integrity.

One welcome development in transparency was pioneered by the medical journals. Authorship of a paper is justified when a researcher has contributed significantly to the work being described and to the writing or approval of the manuscript. But the traditional publication style is entirely opaque as to which co-author contributed what. Concern about 'honorary authorship' — in which an author is unacceptably included for reasons other than any scientific contribution — and about this lack of transparency has led to the increasing use of statements in papers that specify authors' contributions. Some medical journals require them, and others, including the Nature family, strongly encourage their use and may yet make them compulsory.

Such statements delineate contributions to the work but do not underwrite its integrity. Something more is needed.

It is too glib to state that every co-author of a paper shares full responsibility for its content. A researcher who specializes in the radioactive dating of rock strata cannot necessarily be expected to vouch for a palaeontologist's analysis of fossils within them — especially if the work has been carried out in labs on different continents.

The fact that simple trust may no longer suffice is a sad reflection on recent scientific history, but anything that supports public confidence in research has to be welcomed, provided that its burden is not too great. What follows is a proposal in that direction, on which we invite readers' comments.

We suggest that journals should require that every manuscript has at least one author per collaborating research group who will go on record in a way that collectively vouches for the paper's standards.

Each would sign a statement with reference to *Nature's* publication policies (see www.nature.com/authors/editorial_policies/index.html) as follows:

"I have ensured that every author in my research group has seen and approved this manuscript. The data that are presented in the figures and tables were reviewed in raw form, the analysis and statistics applied are appropriate and the figures are accurate representations of the data. Any manipulations of images conform to *Nature's* guidelines. All journal policies on materials and data sharing, ethical treatment of research subjects, conflicts of interest, biosecurity etc. have been adhered to. I have confidence that all of the conclusions presented are based on accurate extrapolations from the data collected for this study and that my colleagues listed as co-authors have contributed and deserve the designation 'author'."

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Principal investigators traditionally bask in the glory of a well-received paper. We are proposing now that they willingly open themselves to sanctions that could be brought to bear should the paper turn out to have major problems.

Misconduct investigators go out of their way to spare anyone apart from the direct perpetrators, but they have indicated concerns over the degree of oversight within collaborations. If the damage to reputations were more widespread in the event of fraud, researchers would be even more fastidious about the data emanating from their labs and the due diligence they would impose. The chances of major frauds, with their disproportionate impact on the reputation of science as a whole, would be diminished. ■

Readers wishing to offer their views are welcome to contribute to an online discussion at http://blogs.nature.com/nautilus/2007/10/accountability_of_co-authors.html.

In for the cull

A government that asks for independent scientific advice had best be ready to take it.

The question of whether British farmers should be allowed to cull badgers, on the basis that the animals may help spread tuberculosis (TB) among cattle, is perhaps not the most momentous matter on which a government has sought scientific advice. But the mishandling of the issue by David King, the UK government's chief scientific adviser, is an example to governments of how not deal with such advice, once it has been solicited and received.

Back in February 1998, the Independent Scientific Group on Cattle TB (ISG) was set up under the chairmanship of John Bourne, a prominent animal-health specialist, to advise the government department that was responsible for the issue at the time. After much deliberation and the submission of several peer-reviewed papers (such as C. A. Donnelly *et al.* *Nature* **439**, 843–846; 2006), the ISG issued its final report on 18 June this year. Its conclusions were robust: "Badger culling cannot meaningfully contribute to the future control of cattle TB in Britain."

King then proceeded to consider the ISG's report along with, in his words, "other scientific evidence", with the help of five specialists of his choosing. On 30 July he gave his report to the secretary of state with a startlingly different conclusion. "Removal of badgers," it states,

“should take place alongside the continued application of controls on cattle.” This report was made public on 22 October.

Last week, King was rightly criticized by scientists and members of parliament for seeming to go back on the ISG’s advice, which the government had itself sought. Badger culling is a politically fraught issue in Britain, pitching farmers against the equally passionate and vocal animal-protection lobby. King’s motives remain unknown but his actions are likely to encourage speculation that his report was written to please the farmers.

In many instances, it is likely that political factors will ultimately overrule scientific ones when a government takes a decision in a contentious field. If this is the case, then surely it would be better not to seek independent scientific advice that will inevitably be ignored. There are countless examples — the planned replacement of the Trident nuclear submarine arsenal, for instance — in which the UK government had no intention of taking independent advice, and so had the good manners not to ask for it.

In the United States, researchers are accustomed to treating the process that feeds scientific advice into the government with some suspicion. The latest incident, in which presidential science adviser John Marburger stands accused of interfering with testimony on climate change and public health first submitted by the Centers for Disease Control and Prevention, merely reinforces this atmosphere (see page 8).

But in Britain, scientists have enjoyed a better relationship with their government and — prior to the badgers episode — little evidence has come to light of advisory recommendations from scientists being cooked or spun to match the government’s intentions.

On 24 October, Bourne and King were called to account for what had happened at a meeting of the House of Commons select committee on Environment, Food and Rural Affairs. Bourne was visibly annoyed, and described King’s report as “hastily written” and “superficial”. Rosie Woodroffe, an expert on conservation biology at the University of California, Davis, and an ISG member, said that the King report was riddled with “small mistakes”. In those circumstances, King’s insistence that “the conclusions in my report are not very different from those that the ISG reached” ring hollow.

It would be a good idea if the Department for Environment, Food and Rural Affairs, which is now responsible for the matter, based its policy on the unfettered advice offered by Bourne’s committee. This would be deeply appreciated not just by the badgers, but by scientists in all spheres who choose to participate in painstaking advisory processes in the earnest belief that their advice will actually make a difference to government policy. ■

“Political factors will ultimately overrule scientific ones when a government takes a decision in a contentious field.”

Because it's there

An Asian Moon race is neither particularly worrying nor especially inspiring.

In the 1960s and 1970s, the United States and Soviet Union mounted dozens of missions to the Moon, orbiting it, crashing into it and landing softly on it. They even went so far as to return samples from it, either with a little help from some humans on hand or, in the Soviet case, without. Subsequently, neither spacefaring power touched the place for almost 20 years. In part this is because their race, such as it was, had ended. It was also because planetary scientists were far more interested in exploring other places. The Moon had a distinct been-there-done-that aura.

But for aspiring nations that have neither been there nor done that, the Moon has a great advantage over other objects of celestial study. Although only moderately interesting, it is very close and relatively easy to reach. So in 2003 it was the obvious target for Europe’s SMART-1 mission, which tested a new sort of rocket propulsion. And it is currently the destination of choice for others seeking to develop their spacefaring prowess.

In September, Japan finally followed a very small lunar mission launched in the 1990s, Hiten, with a much larger and more ambitious one, SELENE. October saw the launch of Chang’e-1 from China (see page 12), timed to coincide with the ‘re-election’ of Hu Jintao as leader of the Communist Party — a piece of celestial theatrics well in tune with the spirit of technocratic command and control that characterized the original Moon race. Next year will see the launch of India’s

Chandrayaan-1 and America’s Lunar Reconnaissance Orbiter, the heavyweight of the current crop.

It is easy to exaggerate the extent to which this constitutes a new Moon race. National rivalries and prestige definitely play a part in some of these programmes: China’s, in particular, is both touted by the government and appreciated by the population as evidence of national accomplishment and ambition. But the idea sometimes floated that this activity reflects a new perception of some sort of value in the Moon itself is wide of the mark.

Although there are interesting scientific questions about the Moon, few, if any, are of the first order. And despite some hype to the contrary, the Moon’s potential as a source of raw materials for Earth’s consumers is ludicrously constrained. There is nothing there worth the cost of bringing back to Earth (not even helium-3, a fuel of unknown utility to a second or third generation of fusion reactors of unknown feasibility). The Moon’s potential as a resupply station for spacefarers visiting other places is also poor, although perhaps not entirely negligible.

That doesn’t mean that the current spate of missions to the Moon is worthless. One learns by trying, and the Moon is a good test bed for mastering the arts of planetary exploration. The same applies, further down the line, to the far more resource-intensive business of sending humans; if you feel you must send humans elsewhere, it is a conveniently near at hand and well-characterized destination.

But the only prize to be won in any race that ends with humans yet again walking on the Moon is global recognition that you have managed to do what was accomplished to little lasting effect back in the days of flower power. It remains unclear that such recognition is worth the already stretched resources of India or China — or of any other nation. ■