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Bad peer reviewers

A small proportion of referees are undermining the scientific process, especially in biology. Some of the problems are getting worse, partly because of changes in scientific publishing.

Most researchers agree that peer review is the least imperfect way of upholding the quality of scientific publications. But those who administer it also have to cope with, and attempt to solve, the problems that peer review gives rise to.

One such problem is misconduct. The peer-review process depends on trust, and the great majority of reviewers are trustworthy, but there are occasions when that trust has been abused by a referee. One of the worst that *Nature* has experienced, some years ago, was when a referee obstructed a paper, and used its information indirectly to obtain materials from the author to complete competing work of his own, which he then promptly published, thereby scooping the original. (The referee has not been used again.)

Like most journals, *Nature* requests that referees disqualify themselves from refereeing a paper that is directly competitive with their own work. We also request that referees either keep the paper strictly to themselves or consult, also in confidence, a close colleague whom they identify to us. We use two and often three referees, and do what we can (which we believe is quite a lot) to spot phoney arguments against a manuscript and to sidestep undue delay.

But there is only so much that *Nature* or any journal can do. Take confidentiality: as can be seen in a survey of the problems (see page 102), scientists vary in their attitudes to the principle of strict confidentiality. Some freely consult colleagues to an extent that others (including some authors) would find horrifying. And it is not unknown for a *Nature* editor to visit a lab and see a manuscript sent in confidence left casually on display on the group coffee-table.

Even more concerning is a discernible growth in cases where referees sit on manuscripts, or are subsequently shown (or strongly suspected) to have plagiarized them, or used them as a stimulus to rush their own, sometimes less-developed versions, into print in a competing journal. On the rare occasions where the offence is undeniable, *Nature* can take sanctions, for example by contacting the offender's employer.

Misconduct in peer review is very infrequent. But in the most competitive areas of biology — molecular biology, in particular — it is, in *Nature*'s experience, no longer unexpected. In seeking to address this regrettable situation, it is important to examine underlying pressures.

The particular competitiveness in molecular biology appears to stem from a number of factors, not the least of which are the rampant egotism in the upper echelons of the field and the urgent need to publish if postdocs and contract researchers are to obtain grants. Furthermore, the route from basic research to commercial exploitation is a particularly short and direct one. Duplication of effort is yet another factor. The risk that years of painstaking work will be reduced to insignificance through being scooped by competitors seems significantly greater in molecular biology than in other disciplines. This is partly because of the inexorable pressure on researchers to attack problems guaranteed to yield quick and safe scientific returns.

With the best of intentions, science publishers are now inadvertently exacerbating the situation. With every encouragement from researchers, more and more journals (including *Nature* and its related titles) are moving in the direction of electronic publication ahead of print. This can be good for science, and especially so where the research has immediate positive implications for human health, for example. But everyone suffers if the practice is allowed to encourage corner-cutting in research and to further stimulate bad behaviour.

Perhaps it is time to review the concept of the scientific scoop. Many journals, including this one, are tough on authors of papers under revision whose results are scooped by others. But papers reporting similar results published weeks apart will all be found by an electronic search of the literature, and the later publications may be of higher quality by virtue of the additional time taken. Maybe there is a better balance to be struck between the recognition of quality and of priority than is currently the norm. ■

Astronomy's real priorities

Debates over the administration of US astronomy funding have highlighted areas for collaboration between agencies.

Astronomers in the United States may feel that they have won a round after a National Academy of Sciences panel gave the thumbs down to a White House suggestion — tentative though it was — that federally funded astronomy programmes be consolidated within NASA (see page 99). There are many good reasons to keep the planning and management of ground-based telescopes within the National Science Foundation (NSF), not the least of which are its close ties to the academic research community.

And the panel's call for a new interagency coordinating body for astronomy could lead to something the White House may not have anticipated when it commissioned the academy study — an ongoing, high-profile forum for astronomers to plead for more money. That, after all, is big astronomy's biggest problem, rather than a lack of coordination between NASA and the NSF. True, communication between the two agencies could be better. But even though they work in separate arenas (ground-based and space-based), the academy panel concluded that the NSF and NASA have done a good job of implementing the priority projects outlined in the astronomy community's 'decadal surveys', which are themselves models of consensus-building.

Certainly, it would be good for astronomers, through standing advisory groups, to help oversee how NSF implements the even larger telescope projects on the drawing-board. And NSF and NASA should develop a joint plan for explaining astronomy to the public.

But it still all comes down to money. If they want world-class results, the Office of Management and Budget and Congress will have to allocate the dollars for more of those expensive instruments that have led, in the words of the academy panel, to the current "extraordinary period of scientific progress" in astronomy and astrophysics. ■