Is political correctness damaging science?

Peer pressure and mainstream thinking may discourage novelty and innovation

Science is hardly unique in relying on peer review to determine merit and success. But for science, the reliance on peers to referee both submissions for publication and applications for grants involves greater dangers than in some other disciplines. It brings the triple risk of conformity, cronyism and plagiarism, which together can smother innovation. At a broader level, there is a tendency for researchers to fall in line with a particular point of view, especially in the more politically charged branches of science such as ecology or climatology. Those who oppose the prevailing orthodoxy risk being branded 'flat earthers' and cast into a wilderness where funding and publications are hard to obtain.

According to Bruce Beutler, professor of immunology at the Scripps Research Institute (La Jolla, CA, USA), peer pressure in its various forms is a particular problem for science. "It is not unique to research, but in science it goes very much against the grain of what's trying to be accomplished," he said. Yet scientists themselves must take some of the blame for perpetuating a system that can stifle original thinking, Beutler contends. "Scientists like to present an image to the outside world as being very iconoclastic and sceptical. Yet they have a complete conformity of opinion on certain things, and they do victimize people who differ from them." By way of example, Beutler cited the atmosphere surrounding the recent US presidential election, in which any scientist who argued in favour of George W. Bush attracted severe ridicule.

More worryingly though, such political correctness can distort research, with consequences not just for scientific direction but also for public matters such as health policy. "I think the best example of conformity of science is the influenza vaccine," said Tom Jefferson, an independent researcher in the UK who specializes in immunology. A longtime critic of the peer-review process

for publication, he said, "On average, only about 10% of the influenza strains in any year are caught by the vaccine, and yet there is a huge push to immunize children." Jefferson accuses decision-makers of failing to understand the true epidemiology of the disease and engaging in an unholy alliance with pharmaceutical companies eager to find a market for their vaccines. But he also implies that immunologists have been too reluctant to stand up against a policy that is not in the best interests of public health or people vulnerable to influenza. Jefferson argues that the annual flu vaccine gives people a false sense of security because it provides only partial protection against the virus strains that circulate at any one time, and would fail to halt a major epidemic.

There will always be scientists like Jefferson who are prepared to take a stance, and some develop a reputation for plain speaking and refusing to toe the party line. Among them is ecologist Jim Brown, Professor of Biology at the University of New Mexico (Albuquerque, NM, USA). "I do occasionally feel the need to speak out when I don't think rigorous scientific theory and data support the currently fashionable, politically correct positions of my establishment peers," he said, citing a recent statement by the Union of Concerned Scientists (2003) that exotic species imported to unfamiliar habitats pose a severe threat to global ecology and biodiversity. Brown refused to sign the statement, arguing that although the biotic exchanges now occurring as a result of human activity are unprecedented, they are not radically different in scale from countless long-distance migrations of species that have taken place naturally throughout evolution.

Whether Brown is correct or not, it is important that he airs his scepticism of the prevailing position on exotic species. This applies equally in the even more contentious field of genetically modified organisms (GMOs), which has been severely polarized due to the public debate over environmental risks. Until recently, the

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pressure was mostly on opponents of GMOs to modify their position, and was driven by the biotechnology industry and institutions that benefit from its funding. Such pressure still exists, as witnessed in the case of Ignacio Chapela, an assistant professor of ecology at the University of California, Berkeley, who reported in 2001 that strains of wild corn in Mexico contained altered genes that could only have arisen through contamination from GM maize grown hundreds of kilometres away in California (Quist & Chapela, 2001). This hotly disputed finding led to fierce debates in GM circles and culminated in Chapela being denied tenure by Berkeley. Whatever the merits of the case, it is clear that Chapela paid a price for his work, although he has become a cause célèbre for the anti-GM lobby.

A similar sort of polarization in the field of global warming has significant implications for future policies on ecology and biodiversity. As with GMOs, the initial pressure came primarily from an industrial lobby that was anxious to avoid carbon taxes and other measures to enforce more efficient energy production. Since then, sentiment has swung progressively behind the proposition that global warming is a done deal, which has increasingly marginalized those who believe there is still uncertainty over whether it is occurring. According to Philip Stott, professor emeritus of biogeography at the School of Oriental and African Studies at the University of London (UK), the idea that human-controlled emissions of greenhouse gases cause global warming has become an article of faith, and any criticism of this notion is taken almost as blasphemy. This, he argued, has led to major decisions by

governments on the basis of immature science, while the case for global warming is still unproven (Stott, 2004). Whether one accepts Stott's arguments—additional evidence in favour of the anthropomorphic global warming proposition has arisen since he wrote the article—it is hard to dispute his assertion that the arguments deployed by a growing number of climate-change scientists use language that tends to be authoritarian and religious in nature, designed to silence those who question man's role in global warming.

Having identified how the course of science can be diverted or hindered by the weight of peer pressure, the question arises as to what can be done to ensure that researchers are not penalized. The issue came to the fore in Canada last year when a panel of medical researchers commissioned by the Canadian Association of University Teachers (CAUT, 2004) warned that the integrity of up to 20,000 clinical staff was at risk because of external pressures. The report cited the case of Nancy Olivieri, a professor of medicine at the University of Toronto, who discovered unexpected risks in a new drug for the treatment of thalassemia (Olivieri *et al.*, 1998). When she informed patients who were enrolled in clinical trials of her concerns, the pharmaceutical company sponsoring the research terminated the trial and threatened her with legal action for breaching a confidentiality agreement. Olivieri turned to the university and the hospital for help, to no avail. It transpired that the University of Toronto had been engaged in negotiations with the same company for what would have been a major donation to the university for a new medical building. In light of such cases, CAUT's medical panel made several recommendations, in particular that Canadian clinical researchers should be granted the security of tenure with guaranteed income and the explicit protection of academic freedom.

Security of tenure helps to preserve the freedom to publish controversial work, according to William Muir, professor of genetics at Purdue University (West Lafayette, IN, USA). Without it, Muir believes, he would have lost his job. "My work on the Trojan gene ... would have got me fired from the university if I had not had tenure—the outgoing dean told me so," he

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said. Muir's Trojan gene hypothesis suggested that transgenes that are engineered into an organism can cause a population to become extinct if they reduce survival fitness (Muir & Howard, 1999). It was controversial partly because it cast doubt on the wisdom of many prevailing practices in agriculture, horticulture and fish farming. The paper led to Muir being verbally abused at conferences, but he emphasized that the university has since rallied round him and featured his research in its publications. "That helped give me the support I needed to face the adverse peer pressure."

Not many researchers come under the kind of pressure Muir faced, but few scientists are totally immune to it. Peer pressure is most commonly

exerted through the ubiquitous peer-review process that virtually all scientists must contend with if they are to progress in their careers. Peer-review pressures are not usually sinister, but scientists often feel compelled to play to their audience, making minor changes to their papers in the hope of pleasing the people they know, or suspect, will review their work.

A number of researchers, journal editors and others have therefore sought ways to reduce the weaknesses of peer review while amplifying its strengths, such as the ability to eliminate technical errors and improve clarity. Jefferson, for example, has written and edited books about peer review and has helped generate ideas for improving the process. These will be submitted at the International Congress on Peer Review and Biomedical Publication in Chicago in September 2005, but Jefferson declined to discuss them in advance—he too, as he ruefully admits, must play by the rules and not break embargoes. But he did point out that some enlightened editors help to make the peer-review process operate better, for example

by treating reviewers more as consultants who offer advice rather than referees who pass absolute judgements. The physics community is testing another possible way forward: pre-publication of papers on the internet before submission to a journal, which opens up the review process to anyone who wishes to contribute. But for this practice to become widespread, leading journals would have to change the rules that discourage public dissemination of results prior to formal publication.

Some scientists advocate abandoning the peer-review process altogether, but the question is what to put in its place. In biomedical research in particular, there is a need for a process that distinguishes between good and bad work before the results reach other scientists, decision-makers and the general public. This is the view of Silvia Cavagnero, assistant professor of physical chemistry at the University of Wisconsin, Madison, USA. "It is not a perfect system, but it ensures that only good quality science emerges into good journals." Cavagnero admits that bias on the part

of peer reviewers can retard publication of good work, but urges scientists to be persistent in such cases and they will eventually prevail. "The unavoidable biases of the peer-review process may somewhat slow down the process of divulging good quality work, but, most importantly, they do not suppress it," she said.

The hope that the defects of the peer-review system are not fatal also applies to the grant application process, according to Stenbjörn Styring, professor of molecular biology at Uppsala University in Sweden. Styring admits that when applying for grants, particularly for projects funded by the European Union, it is essential to know how to phrase the proposal and use the kind of language that reviewers want to hear. "But the application has to be good too," he added. In any case, Styring suggests that the scientists who are

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most adept at applying for grants or even moving into politically acceptable fields tend also to be the most original researchers, and succeed in overcoming bias. It is the lesser scientists who go by the book whose careers are more likely to suffer from the pressure to be politically correct or play to the audience, Styring believes.

"I think we must accept the problems of the system and get on with it," says Bill Rutherford, a research director at the French Atomic Energy Commission (CEA; Saclay, France). Rutherford agrees that improvements are needed, and that scientists who do review also need to be wary of the system. A particular problem for reviewers, says Rutherford, comes from ultra-sensitive scientists who consider themselves above criticism. His advice is to decline to review their articles: "That way you can save all that

tedious looking in the rear-view mirror and checking under the car for booby traps."

It seems certain that peer pressure cannot be fully eliminated when it comes to publication and grant approval. Even with free licence to publish and pursue whatever research they like, scientists can never be totally immune to the pressure of their peers, whether it is exercised at conferences or through influence. Scientists must cope with these pressures, and in some cases need courage to pursue lines of enquiry or seek publication for results that confront prevailing orthodoxies or offend commercial sponsors.

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