

'Open access' will not be open to everyone

Making authors pay for publication may not deliver the anticipated benefits.

Sir — With the best intentions, a group of American biomedical scientists and physicians proposes to make all scientific research “available free of charge to anyone”. They have formed the Public Library of Science (PLOS) and plan to build their library by starting new journals, all of which will be open access. They will support their journals by charging authors, not subscribers, for each paper that is published. The fee will be something like US\$1,500 per paper — maybe more, maybe less. Their model, they say, “treats the costs of publication as the final integral step of the funding of a research project”.

In reality, not all researchers are funded by research grants. Less than half of active research mathematicians are supported by federal grants in the United States; some estimates are considerably lower than this. Mathematics is not alone: in virtually every field, there are many scientists doing outstanding research who are not part of any large, federally funded project.

Who pays the \$1,500 for these people?

Much published research also comes from outside the United States. More than half of the articles published in the American Mathematical Society's primary research journals during the past 20 years do not have a US author. Who pays the \$1,500 for these authors? Yes, it's true that many such authors come from countries that have funding agencies themselves, but many others are from developing countries. During those same 20 years, of the 1.5 million journal articles listed in *Mathematical Reviews*, 68,000 had authors from the former Soviet Union, 26,000 from India, 26,000 from Poland, nearly 4,000 from Egypt, and more than 600 from Nigeria. Who pays the \$1,500 for these scientists?

The PLOS editors suggest that authors who are unable to pay won't have to. But this assumes that few authors are unable to pay — a false premise in many disciplines.

It is often assumed that universities or

institutes will pay the \$1,500, if no one else will. But how will universities and departments decide which faculty and which areas of research are supported? What happens to faculty in small colleges with limited resources? Publishing papers only from those who can pay is a dramatic change in culture, and the change may not be the intended one.

Each publication model — subscription-based or author-supported — has trade-offs, but they are not symmetric trade-offs. When a scientist doesn't have a subscription, he or she can nonetheless get information about the article (the abstract and perhaps a list of references); requesting a copy of the article can be as easy as sending an e-mail. When a scientist doesn't have the funds to publish an article, the article does not appear — does not become part of the permanent literature. That's more than an inconvenience.

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Flaws undermine results of UK biotech debate

Sir — The *GM Nation?* report released in the United Kingdom last month (see *Nature* **425**, 331; 2003) concluded that the general public is overwhelmingly against genetic-modification (GM) technology, with feelings ranging from “suspicion and scepticism, to hostility and rejection”.

The study cost £500,000 (US\$830,000). Unfortunately, this was not money well spent. The methodology was so badly flawed that the data not only failed to support the authors' conclusions, but undermined them.

The main fault with the study, as the authors concede, is the self-selected nature of the main sample. About 36,000 people took part in an “open debate”: half of these responses came by mail and half from the *GM Nation?* website (www.gmnation.org.uk). This sample is certainly large, but it is not random. It is in fact most likely to attract those who have strong opinions about GM. One might think that the sheer size of the sample swamps any problems with its self-selected nature, but for that to be the case you would need millions of participants.

Although the authors of the report were aware of this criticism, they offered only two countermeasures. First, they checked a random sample of responses to see if there were any standardized ones being sent in by activist groups, which there weren't. But

people with strong views on GM are capable of expressing their own opinions, and this measure does nothing to prevent the sample being biased in favour of them.

Second, they commissioned a ‘narrow-but-deep’ study from another company, “as a control on the self-selecting participants in the open debate”, to see if there was a “silent majority” with different views. This meant asking 78 people 13 questions from the open debate. This sample was randomly chosen — although the report is short on specific details — and stratified so that it roughly matched the general population. (This group was also re-tested after 2 weeks of group discussion and personal research to see if their attitudes to GM changed.)

The authors of the narrow-but-deep section conceded that their results were not statistically robust, because of the small numbers involved. Nevertheless, they said: “We believe it is an accurate reflection of the general public.” The initial responses of the random group were, however, noticeably different from the results of the open debate. (Even after 2 weeks, the differences, although not as large, remained significant.) Yet the *GM Nation?* report claimed that, apart from some minor differences, the two groups agreed. The general public, said the authors, is not “a completely different audience with different values and attitudes from an unrepresentative activist minority”.

The actual results from the two groups were buried within the supporting

documents, far apart from each other. Once these results are compared side-by-side, startling differences emerge for more than half of the questions used (visit www.nottingham.ac.uk/philosophy/staff/Campbell/Table1.htm for a full comparison).

For example, to the question “I would be happy to eat GM food”, only 8% of the open-debate respondents agreed, compared with 35% for the random group. On the topic of whether GM was unnatural, 84% thought so in the open debate, but only 37% did in the random group.

We find it astonishing that the obvious mismatch between the random group and the open-debate group was not discussed anywhere in the report, and that it did not prevent this report being released and becoming headline news.

With £500,000, a larger version of the narrow-but-deep study could have been conducted, avoiding the problem of self-selection. As well as using a ‘topic blind’ recruitment strategy, questions about GM food would ideally be embedded among questions about other current concerns, so that the participants would be unaware that GM food was the focus of the research. Also, the sort of vague and leading questions used by *GM Nation?* should be avoided. Only then could we be confident that the findings are reliable and realistic.

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