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E-biomed

Lately, I sent an article to three reviewers and two of them proved to have refereed it already for other journals. Apart from generating gloomy thoughts about the place of the *JRSM* in the pecking order, this episode set me thinking (not for the first time) about the extravagance of the existing system of peer review in its use of experts and their freely given time. If Dr X and his colleagues persevere, they will eventually find an accommodating editor; but when the paper is published, how many reviewers will have donated an hour or two to it—15, 20, 30? For that matter, how many editors? So, instead of consigning it to a little-read journal, why can they not place their respectable but unexciting data forthwith in an electronic archive, for ready retrieval by interested parties?

Such an archive is now being advocated by Harold Varmus, Director of the US National Institutes of Health. But his concept is much bigger and more enterprising than this. Varmus envisages an electronic 'public library' of medicine and other life sciences that would offer substantial advantages over print-on-paper—not least, instantaneous cost-free access 'in a manner that is free of barriers, international in scope, and seamless in operation'. Suppose you have identified a gene, or completed a large and important randomized trial, or had a clever idea that you wish others to pursue, or you have simply encountered a remarkable patient: Varmus's scheme, known provisionally as E-biomed, would offer two levels of publication. In level 1, your paper would be submitted via a central server to an editorial board, which might be that of a journal or a body appointed for the purpose by a specialist society or other group. If, after peer review and revision, the paper was accepted for publication, it would be posted immediately in the electronic archive (E-biomed), and the title and list of authors would appear for a fixed period in the table of contents of the journal. Subsequently the article would be accessible either through the journal's website or through the E-biomed search engine. If it was not accepted, you could either proceed to your journal of next choice in the system or go directly to level 2. In the second level, articles will not be peer reviewed but must be approved by two of a corpus of 'validators', whose main task is to exclude 'extraneous or outrageous' material. On acceptance, the article will go instantly into the database. Commentaries by other investigators could be attached; authors would retain copyright and would be able to submit the material later to a journal. Electronic guides to E-biomed would keep clinicians and others up-to-date on their special interests.

Varmus's scheme offers a wonderful way to liberate a knowledge system in which information is often hard to extract, which is perceived to exploit authors[1], which is expensive, and which is increasingly dominated by a small number of commercial publishers. Read for yourself the original proposal and the subsequent discussion on the website[2] and, when examining adverse comments from some journals, ask yourself whether the writers might have a conflict of interest (did you know, for example, that publication of a drug trial can earn a journal a six-figure sum in reprint sales?). The international publishing conglomerates may shudder, but doubtless they can look after themselves. More sympathy is due to the scientific societies that at present derive much of their revenue from journal subscriptions and advertising. Varmus is at his vaguest when discussing how they could make up the deficit on transition to an electronic system. My biggest disappointment was the failure to address the point-scoring system that has come to plague and distort journal publication—citation rates, impact factors, and the like. For an editor, the important question is not whether a paper is cited but whether it is read (sometimes inversely related); and the electronic system could offer a measure of readership by recording the number of 'hits' on the website.

My second biggest disappointment is that Varmus does not pursue the idea that articles might be reviewed initially by specialist groups rather than by journal editors. At present, journals at the top of the 'impact' hierarchy have rejection rates approaching 90%, and acceptance is determined by many factors other than quality. The editors of such journals devote a large part of their energy to material that will eventually be rejected—especially those who see an educational duty to provide most of the authors with expert feedback; this generates a vast burden of work for all concerned, including the referees. In contrast to journals, level 1 of E-biomed would have only a single criterion for entry—acceptable quality—and a peer review scheme that was detached from journalistic considerations might promote improvements in a system that is at present (in the words of Richard Smith) judged 'slow, expensive, profligate of academic time, highly subjective, prone to bias, easily abused, poor at detecting gross defects, and almost useless for detecting fraud'. An excellent new book

from the *BMJ* stable[3] illustrates how we might address the many weaknesses of peer review—not least, by research of a kind that might be pursued in the context of E-biomed. If journals were excluded from the initial E-biomed evaluation; if articles were assessed systematically by individuals who were trained (and perhaps paid) to do it; if different methods of evaluation and reviewers of different sorts were compared by controlled trials; if reviewers' reports became a transferable part of the record—then one beneficial outcome of the electronic project could be less peer review, done better. As to the non-peer-reviewed level 2, critics have expressed alarm that it would allow transmission of dangerously misleading material on patient care or public health—to which Varmus replies that this objection applies to the great body of medical information already on the Internet, and that every report in the database would carry a clear indication of how it entered.

The proposal for E-biomed opens a new vista. A soviet-style monopoly? It will fail, says Varmus, if the international scientific community is not broadly represented in its operation and governance: E-biomed 'welcomes the participation of existing journals, does not obligate any journals to join, and would not be owned by the NIH or any other component of the U.S. government'. Even so, confidence might be higher if it functioned from centres in several different parts of the globe. In the age of E-biomed, will the paper journal survive? I believe so in certain cases, but the principal medium for scientific discourse will be electronic. The successful print editors will be those who switch allegiance from contributors to readers, pay no attention to citation analyses and use the electronic archive as a resource for comment and analysis.

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2 http:/www/nih.gov/welcome/director/ebiomed/ebiomed.htm

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