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## Peer Review: The History, the Issues, and New Directions

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# Against the Grain

“Linking Publishers, Vendors and Librarians”

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## Peer Review: The History, the Issues, and New Directions

by **Irving Rockwood** (Editor & Publisher, CHOICE, 575 Main Street, Suite 300, Middletown, CT 06457) <irockwood@ala-choice.org>

Perhaps the very first question to be answered in an article on peer review is, “Who cares?” And in truth until several years ago when I casually agreed to moderate a panel on current issues in peer review, that would have been precisely my response. However, as I have since learned, peer review is a much more important and more exciting topic than it might first appear.

For one thing, there are a lot of folks interested in it. The topic of peer review has spawned an extensive literature and at least one major continuing series of conferences, the **International Congresses on Peer Review and Biomedical Publication**. The sixth of these gatherings, jointly organized by **JAMA** and **BMJ**, will be held in Vancouver this coming September, and if past experience is any guide, it will be well attended. The fifth **Congress**, which was held in Chicago in September 2005, attracted 470 participants from 38 countries who assembled to attend a

program featuring 42 reports and 53 posters on editorial peer review. A similar group will presumably be gathering in Vancouver this fall. If this sounds appealing, you’ll want to visit the conference Website, <http://www.ama-assn.org/public/peer/peerhome.htm>, and you might want to hurry. Registration is now open. And if you can’t wait until September, there is at least one earlier alternative, the “**International Symposium on Peer Reviewing**,” which is being organized as part of **The 3rd International Conference on Knowledge Generation, Communication, and Management: KGCM 2009** to be held July 10-13, 2009 in Orlando, Florida. For more information, see <http://www.ICTconfer.org/kgcm>.

Peer review, it turns out, also has a lengthy history. That history is generally traced back to **Henry Oldenburg** (1619-1677), the first Secretary of **The Royal Society of London** and the first editor of *The Philosophical Transactions*, the world’s oldest scientific journal in



continuous existence, which he founded in 1655. **Oldenburg**, who founded *The Transactions* primarily for financial reasons (with disappointing monetary results despite a print run of over 1,200 copies — a result that would feel quite familiar to many contemporary scholarly publishers), found that he quickly received many submissions of dubious quality. In response, he began calling on colleagues who were subject matter experts — he was himself a trained theologian, not a scientist — for advice on the worthiness of papers submitted for publication. And so began peer review.

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## If Rumors Were Horses

The votes are in! **Lyrasis** and **NELINET** members voted to approve the Board resolution for **NELINET** to join **Lyrasis** with a “YES” vote of over 94%. The effective date for this union is Fall, 2009. Work has already begun on the organizational transition. To be continued! [www.lyrasis.org/](http://www.lyrasis.org/)

Just got word from the energetic **Grace Baynes** <g.baynes@nature.com> that **Nature** (published continually since 1869) was named “journal of the century” by the **BioMedical & Life Sciences Division (DBIO)** of the **Special Libraries Association (SLA)**. The award was presented at the annual **DBIO Business Luncheon** during the **SLA’s Centennial Conference** in Washington D.C. The journal



of the century award was voted for by **DBIO’s** 686 members. Runners-up included the **New England Journal of Medicine**, **Science**, the **Journal of the American Medical Association (JAMA)**, and **The Lancet**. In conjunction with **SLA’s Centennial**, **DBIO** conducted a poll of its members to identify the **100 most influential journals of Biology & Medicine over the last 100 years**. A list of the top 100 journals is available on the **SLA Website**. [units.sla.org/division/dbio/publications/resources/dbio100.html](http://units.sla.org/division/dbio/publications/resources/dbio100.html) [www.nature.com](http://www.nature.com)

Speaking of which, **Ann Okerson’s Liblicense** has been abuzz with news of an article in *Nature* by **Phil Davis** (Cornell) and **Kent Anderson** (New England Journal of Medicine). They relate how they submitted

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## Peer Review: The History ... from page 1

Today, of course, we think of peer review as synonymous with the scholarly journal. But this is actually a relatively recent development dating from the post World War II era. As the first modern scientific journal, *The Transactions* may have spawned many successors, but only some adopted peer review. Many of the new journals, possibly most, simply relied on the editor's judgment. For example, **Albert Einstein's** revolutionary "Annus Mirabilis" papers, which appeared in the 1905 issue of *Annalen der Physik*, were never subjected to peer review. Instead, the journal editor-in-chief, **Max Planck** (the father of quantum theory and a **Nobel Prize** winner), reviewed the papers himself and then published them in a splendid example of operational efficiency and one-stop shopping.

In the United States, it was not until the post-World War II science boom that peer review became accepted practice in the review of grant applications and scholarly publishing, our primary arena of interest. According to **Jonathan Cole**, Provost and Dean of Faculties at **Columbia** and co-author of a number of works on peer review, "It came into full force after the war with the establishments of the **National Science Foundation** and the **National Institutes of Health**. That is where the principle of merit-based review was very clearly established and has been followed ever since."<sup>1</sup>

Before proceeding further, it is appropriate to offer a working definition of our subject. In its most traditional or classic form, peer review is the pre-publication review and written evaluation of a manuscript by one or more subject matter experts ("peers") selected by the editor or publisher for the purpose of assisting him or her with the final publishing decision. There are several commonly encountered varieties of peer review. In "blind review," the written review is anonymous, i.e., the reviewer's identity is not disclosed to the author. If the author's identity is also concealed, i.e., not made known to the reviewer, this is known as "double-blind" peer review. In "open peer review," on the other hand, the reviewer's identity is disclosed to the author.

While the mechanics of peer review vary, the final publishing decision, it should be noted, always rests with the editor or publisher. Nonetheless, the content of the review typically plays a major role. While it may occasionally happen that an editor or publisher chooses to publish an article, or book, that has been unanimously savaged by the reviewers, this is almost always a rare, and potentially newsworthy, event.

In short, peer review is a process in which scholarly manuscripts are selected for publication based on written evaluations by subject matter experts, or peers. Sometimes known as merit-based review, it ensures that scholarly articles and books are vetted for accuracy, relevance, and quality before acceptance by the publisher. In essence, peer review is a certification process in which scholars review the work of other scholars to evaluate its quality and readiness for publication. As such it is generally viewed as the "gold standard" by which a scholar's publication record is judged. While there are outlets for scholarly articles and books that do not employ peer review, scholarly reputations are largely based on peer reviewed publications, the quantity and quality of which are a widely accepted measure of status within the field. Thus peer review as it has come to be practiced today performs two important functions. First, it provides a generally accepted framework for making scholarly publishing decisions, thus shaping the scholarly literature. In addition, it has become an intrinsic element in the professional certification process, a matter of no small importance to authors.

However, what makes editorial peer review truly interesting today is neither its history nor its mechanics, but a growing sense of concern about its adequacy as an impartial and accurate selection tool. While many, perhaps most, observers still view peer review as the "gold standard" against which to measure other evaluation tools, there has in recent years been a growing chorus of criticism, particularly — but not exclusively — from younger scholars and minorities. For one thing, as has long been noted, there is an inherent risk of conflict of interest built into the peer review process. As the science historian **Horace Freeland Judson** observed, "...the persons most qualified to judge the worth of a scientist's grand proposal or the merit of a submitted research paper are

precisely those who are the scientist's closest competitors."<sup>2</sup>

Beyond this, peer review has been criticized as unreliable, idiosyncratic, and open to every sort of bias. It has also been repeatedly criticized for failure to validate or authenticate, as evidenced by any number of incidents involving the publication of invalid or fraudulent research.<sup>3</sup> Furthermore, some critics have argued that peer review, rather than advancing science, stifles innovation, perpetuates the status quo, and rewards the prominent. In addition, they have charged that peer review causes unnecessary delay in publication, is very expensive, and insufficiently tested.<sup>4</sup>

Proponents of peer review, while acknowledging the validity of some or all of the criticisms levied against it, have generally tended to respond that, for all its faults, peer review remains an essential cornerstone of the scientific and scholarly process. Peer review, proponents sometimes say, is like democracy, which, to use **Winston Churchill's** famous phrase, "is the worst form of government except all those other forms that have been tried from time to time."<sup>5</sup> It is, in their view, easy to criticize peer review but much harder to come up with a better system.

Such arguments have neither satisfied nor silenced the critics, some of whom have called for the total elimination or replacement of the current system. **Horrobin**, for example, has argued that peer review "is a non-validated charade whose processes generate results little better than does chance."<sup>6</sup> More recently, in a provocative piece that became the most downloaded technical paper at **PLoS Medicine**, **John P. A. Ioannidis**, an epidemiologist at **University of Ioannina School of Medicine** in Greece and **Tufts New England Medical Center**, asserted that "There is increasing concern that most current published research findings are false."<sup>7</sup> Arguing that simulations show that "for most study designs and settings, it is more likely for a research claim to be false than true," **Ioannidis** called for improved and more rigorous statistical analysis of research findings in order to provide a more accurate assessment of validity.

It is fair to suggest that the continuing debate over peer review is unlikely to be re-

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## Rumors from page 14

And, more about **ProQuest**. I can't forget to tell you about **Jim Morris**, another great person! Not to be confused with **Jim Morrison** (above), **Jim Morris** was telling me about the **ProQuest digital microfilm** which is worth paying attention to. And, I remember that **Jim** is a huge fan of **fried chicken livers**. We just had a going away party for one of our student workers who devoured a huge plateful of fried chicken livers. We were at **Virginia's on King** (across from the **Francis Marion Hotel**). Hmmm...

And, you know what, at the **Oxford Acquisitions Conference** (see above), one of the speakers was the gorgeous **Kathy Ray** who is the librarian at the **American University of Sarjah**, United Arab Emirates. Remember **Ron Ray**? Used to be at **University of the Pacific**? Well, **Ron** is **Kathy's** husband. He is now in IT and enjoying himself, **Kathy** says.

<http://www.aus.edu/>

**OCLC** and the **Bibliothèque nationale de France** have signed an agreement to work cooperatively to add records from the French national library to **OCLC WorldCat**. Plans are for **OCLC** to process an estimated **13.2 million bibliographic records** from the **Bibliothèque nationale de France**. **OCLC** and

the **Bibliothèque nationale de France** have worked together on other projects, such as the cooperative effort to create the **Virtual International Authority File (Fichier d'Autorité International Virtuel)**, which combines multiple name authority files into a single name authority service, and French translations of the **Dewey Decimal Classification** system.

[www.oclc.org/us/en/worldcat/catalog/national](http://www.oclc.org/us/en/worldcat/catalog/national)  
[www.bnf.fr](http://www.bnf.fr)

The **Sir Paul Getty Bodleian Bookbinding Prize** was awarded for the first time in a special ceremony which celebrated the official opening of the exhibition **BOUND FOR SUCCESS: Designer Bookbinders International**

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## Peer Review: The History ... from page 16

solved soon. However, even as it continues, the Internet is providing the impetus for much experimentation and change. These experiments may be categorized in a variety of ways. The scheme advanced below has been adapted from one originally advanced by **Matt Hodgkinson**, a **BioMedCentral** Senior Editor.<sup>8</sup> It classifies these efforts into five basic types:

- **Open peer review:** a variation of traditional pre-publication peer review in which the reviews are published along with the articles. In some cases, readers are allowed to post comments. Example: the **BMC-series** medical journals.
- **Open and permissive peer review:** articles are published if reviewed by some specified minimum number of reviewers. Example: *Biology Direct*.
- **Pre-publication community peer review:** a form of prepublication review in which the reviewers are volunteers rather than having been selected by the editor or publisher. Example: *Atmospheric Chemistry and Physics*, which combines a pre-publication quality check and community peer review with publication of a revised final draft following an interactive public discussion period. (See **Pöschl** article below.)
- **Pre-publication peer review coupled with post-publication discussion and commentary:** combines a streamlined pre-publication peer review process with post-publication discussion and commentary that is facilitated by providing readers with the ability to comment on and discuss published materials. Examples: *PLoS ONE*. (See **Binfield** article below.)
- **Post-publication community peer review:** this utilizes a streamlined pre-publication screening process in the expectation that peer review will occur post-publication as the scholarly community comments on, evaluates, and annotates the published article. Examples: *Nature Precedings*.

The articles comprising this feature provide a variety of perspectives on the current status of peer review and its evolving role in scholarly communication.

- **Mark Ware**, former Director of **IOP Publishing** and currently principal of

**Mark Ware Consulting** in the UK, reports on a recent major international survey of scholars attitudes toward peer review that is based on over 3,000 responses from academics around the world. "Overall," he concludes "we see a picture of academics committed to peer review with the vast majority believing that it helps scientific communication."

- **Peter Binfield**, the San Francisco based Managing Editor of the Open Access journal *PLoS ONE*, describes and explains *PLoS ONE's* innovative editorial process and reports on its phenomenal rate of growth. He observes that he and his colleagues "believe that the *PLoS ONE* formula may have the potential to accelerate, and improve, the nature of research itself."
- **Ulrich Pöschl**, a Research Scientist in the Biochemistry Department at the **Max Planck Institute for Chemistry** in Mainz, Germany, and Chief Executive Editor of *Atmospheric Chemistry and Physics*, an Open Access journal founded in 2001, reviews and explains *ACP's* interactive peer review strategy. *ACP*, he reports, has not only experienced rapid growth; it is financially self-supporting.
- **Gary Hall**, Professor of Media and Performing Arts at **Coventry University** in the UK, discusses the role of peer review in the humanities. He goes on to advance a provocative proposal for full disclosure in scholarly publishing, which he calls the **Open Scholarship Full Disclosure Initiative**. Designed to encourage more responsible behavior by journal editors, publishers, and the authors whose material they publish, it is, as the subtitle suggests, a potentially subversive proposal.
- Finally, **David Shatz**, Professor Philosophy at **Yeshiva University** in New York, examines a topic near and dear to this editor's heart, the unique status of book reviews. Book reviews, he concludes, are a special case within the field of scholarly communication, one where there is considerable room for improvement.

Who cares about peer review? Many people, particularly those committed to the advancement of knowledge and scholarly communication. Peer review, it's not an exciting topic for most people, but it's a critically

important one for scholarly authors, researchers, publishers, and librarians alike. With a little luck, the articles comprising this feature will encourage all of us to reconsider our own attitudes and beliefs about this important area of scholarly practice. 🍷

### Endnotes

1. **Tom Abate**, "What's the verdict on peer review?", accessed on May 6, 2009 at <http://www.columbia.edu/cu/21stC/issue-1.1/peer.htm>.
2. **Horace Freeland Judson**, "Structural Transformations of the Sciences and the End of Peer Review," *Journal of the American Medical Association*, 272 (July 13, 1994), 92-94.
3. See, for example, **Hwang Woo-suk** et al., "Patient-Specific Embryonic Stem Cells Derived from Human SCNT Blastocysts," *Science*, May 2005, a work whose stunning findings were hailed as a scientific breakthrough on publication only to be later discredited and declared "an intentional fabrication" by a **Seoul National University** panel some seven months later. Or the case of **Jan Hendrik Schön**, who at one point was publishing at the rate of one research paper every eight days and who received at least three prizes from 2001 to 2002, only to be charged with scientific misconduct in September 2002, resulting in the withdrawal of over 20 published papers from prestigious journals including *Science*, *Nature*, and *Physical Review Journals*, all of which had been peer reviewed. If the ease with which this author located these and other similar examples is any indication, this is but the tip of a very large iceberg.
4. For a more comprehensive overview of the history, criticisms, and defenses of peer review, see **Drummond Rennie**, Editorial peer review: its development and rationale, accessed on May 6, 2009 at <http://resources.bmj.com/bmj/pdfs/rennie.pdf>.
5. **Drummond Rennie**, "More peering into editorial peer review," *Journal of the American Medical Association*, 270 (December 15, 1993), 2856-58.
6. **D. Horrobin**, "Something rotten at the core of science?" *Trends in Pharmacological Sciences*, Vol 22, No. 2, February 2001.
7. **John P. A. Ioannidis**, "Why most published research findings are false," *PLoS Medicine*, 2(8): e124 (2005) doi:10.1371/Journal.pmed.0020124.
8. **Matt Hodgkinson**, "Open peer review & community peer review," accessed on May 6, 2009 at <http://journalology.blogspot.com/2007/06/open-peer-review-community-peer-review.html>.

## Rumors from page 16

**Competition 2009.** Recognizing the best of craftsmanship and creativity in the contemporary art of bookbinding, the first prize was awarded to **Alain Taral** of France, for an extraordinary binding made of pear wood covered by a myriad of exotic veneers. **Taral** uses "fusion" marquetry as his cover decoration, utilizing many different precious wood

veneers including palm tree, yew, bubinga, lati, plane tree, amboina, elm burrs, thuya and faiera. The second prize went to **Jenni Grey** from the United Kingdom. Her innovative approach to the competition theme saw the pages divided into two bindings: "Water" and "Waterborn." There were 25 distinguished winners representing nine countries: Germany (8), United Kingdom (6), France (4), Estonia (2), Belgium, Spain, Sweden, Italy, and Japan. In his Foreword to the accompanying exhibi-

tion catalogue, **Mark Getty** says: "My father began collecting bookbindings while he was still a young man. I am therefore delighted to have had the opportunity to sponsor this competition and in particular to have sponsored the top prizes in honour of my father. The **Sir Paul Getty Bodleian Bookbinding Prize** recognises the best current bookbinding in the world, and it is fitting that the **Bodleian Library** and the **Library at Wormsley** should

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