

Scientific publishing in the times of open access

Adriano Aguzzi

Editor in chief, Swiss Medical Weekly / Institute of Neuropathology, University Hospital of Zurich, Switzerland

By enabling readers to respond and interact, the ongoing evolution of the internet is catalysing a profound transformation of the publishing business. While the end product of this process is not yet recognisable, its impact is comparable to that triggered by Johannes Gutenberg's invention of the movable type – and scientific publishing has not been spared by these momentous developments. The push for “Open Access” publications may have captured the largest mindshare of librarians and policy-makers, yet other aspects may turn out to become even more important in the years to come.

The Open Access movement derives its strength from its unquestionable idealism. Given that the prime purpose of science is to advance the knowledge of mankind, shouldn't all mankind be made privy to such knowledge, directly, with no strings attached, and – most importantly – without having to pay for it? The moral justification for Open Access becomes all the more compelling when one considers that most research (including, notably, much of the research carried out at private companies) is funded by the tax-paying public. While the big publishing houses have initially resisted, and often derided, the propositions of the Open Access movement, the validity of the model is now almost universally accepted. The Public Library of Science (PLOS) [1] publishes a conspicuous fraction of the entire world's scientific output, and even big conservative publishing houses like Elsevier and Nature have started featuring Open Access titles within their journal collections.

What is more rarely discussed, however, is the darker side of the Open Access model (at least as it is generally practiced today). You see, Open Access does not magically make the costs of publishing a journal disappear. What it does, instead, is to shift the cost of publishing from the readers to the authors, who are typically requested to pay a fee for seeing their paper published. In truth, this “dirty little secret” of Open Access publishing creates a conflict of interest which is virtually impossible to resolve: the more scientific papers get published, the higher the revenues of the publisher. Consequently, human nature being what it is, any fledgling (or struggling) journal may feel tempted to subordinate the scientific soundness of any submitted manuscript to the harsh pressure of economic realities. This conflict of interests is intrinsic to the author-pays model and, of course, this is the reason why a plethora of Open Access pseudopublishers have opened shop, whose

business models range from the slightly malodorous to the blatantly fraudulent. The names of these so-called “science publishers” are well known to the scientific community, whose inboxes are regularly flooded by their email spam campaigns.

Mind you, none of this should be taken to imply that the Open Access model is inherently flawed. But how can we ensure that scientific excellence will always prevail over – financial considerations? In my view, any remedy must uncouple the publication of manuscripts from the economic interests of the publisher. This has sometimes been called the “Platinum Open Access” model, and relies on sponsors for bearing the costs of publishing the journal. While philanthropists can also act as sponsors, publications can more realistically be sponsored by consortia of Universities and Academies.

By running their own Open Access enterprises, the scientific enterprises can cut out the middlemen and save costs – while at the same time enforcing their own standards of ethics and scientific rigorousness in publications. One particularly successful example of such a “Platinum Open Access” Journal is eLife [2], which is supported by the Wellcome Trust, the Max Planck Society, and the Howard Hughes Medical Institute.

The *Swiss Medical Weekly* has pledged to follow the Platinum Open Access model. Current sponsors of *Swiss Medical Weekly* are the Swiss Academy of Medical Sciences and the Swiss Federation of Medical Doctors. Neither authors nor readers are requested to pay for publishing and/or enjoying the papers of the *Swiss Medical Weekly*. As a result, the only criteria for the acceptance of a manuscript submitted to the *Swiss Medical Weekly* are its scientific soundness, its novelty, and its usefulness to the readership. No other considerations play any role in the editorial decision process, and – crucially – all financial issues are removed from the equation.

Another development that is completely changing the landscape of scientific publishing is the post-publication review (PPR), which is bound to upend the process by which scientific reports are judged and rated. For the past century, we have always operated under the assumption that scientific peer reviewing, which lies at the heart of all reputable journals of science, is the worst methodology of science publishing – except all the others that have been tried from time to time (as Churchill might have said).

Yet the flaws of conventional peer reviewing are glaring. Any submitted paper will be judged by two to three peers, each one of whom will unavoidably suffer from his or her own biases and will be more or less conversant in the area which is to be judged. As a consequence, the peer reviewing process can become very arbitrary. Many of us have experienced that the very same manuscript can be shredded into tiny pieces by *Nature*, and – upon resubmission – published by *Science* without a blink (or vice versa). Until now, however, it was hard or impossible to envisage a system that would do away with these conspicuous flaws of the peer reviewing system.

PPR is about to change all that. Its premise is that any publication appearing in an Open Access journal can be scrutinised by any reader anywhere in the world – and particularly extraordinary claims may be submitted to extraordinarily thorough scrutiny. Web sites such as Pubpeer.com are dedicated to such post-publication exercises. As a result, any given paper may no longer be judged by just two or three peers *ante factum*, but maybe by thousands of them *post factum*. The result is inevitably going to ensure a much more stringent quality control. An interesting mode of interactive reviewing was championed by StackOverflow [3], a technical web site for software engineers. There, software snippets, bug reports, questions and answers are continuously rated by the community – with both posters and raters gaining reputational points for their activities. Posts can be upvoted or downvoted, but downvotes cost points and are therefore used judiciously. The result is a vibrant, incredibly useful and up-to-date compendium of computer science, and the biology community would be well-advised to take note. The *Swiss Medical Weekly* is committed to post-publication peer reviewing as a crucial new tool towards the self-correction of science. In the long run, I envisage an informal, low-threshold system of discussion and dialogue in which any paper will be commented upon by peers similarly to how social media such as Facebook function.

PPR complements the conventional peer reviewing, but we do not believe that it makes it disposable. Quite on the con-

trary, we at *SMW* believe that the referees of scientific papers should be duly rewarded for their work, which is entirely crucial to the edifice of science.

For this reason, *Swiss Medical Weekly* intends to pay an appropriate honorarium to its referees. Naturally, it is difficult to set a specific monetary value for the (invaluable!) services of the reviewers, but we strongly feel that we should not simply expect our referees to work pro bono – and our gratefulness should extend beyond lip service.

In summary, scientific publishing is entering exciting times. The impact of technological innovations, spurred by the “Web 2.0”-style, interactive internet, goes well beyond increased productivity and is beginning to reshape the very social fabric of scientific endeavour.

In its ongoing renewal process, the *Swiss Medical Weekly* is fully committed to embrace completely these developments. With the help of its authors and its readership, our publication strives to become the premier address for interesting and impactful developments in the biomedical sciences.

Disclosures

The author is the Editor in chief of the *Swiss Medical Weekly* and sits on the Editorial Board of *Science*.

Correspondence:

Professor Adriano Aguzzi
Institute of Neuropathology
University Hospital of Zurich
Schmelzbergstrasse 21
CH-8091 Zürich
Switzerland
[adriano.aguzzi\[at\]usz.ch](mailto:adriano.aguzzi[at]usz.ch)

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