

Edit or perish: The Web 2.0 revolution of the Scientific Edition

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The current scientific publishing system is largely inherited from an ancestral model born with Gutenberg. This model has played a key role in the dissemination of knowledge and therefore its progression. Here, we argue that this model now comes out of breath because of some recent editorial drifts. We analyze these abuses and propose solutions for a sustained scientific edition.

The act of publication is one of the pillars of Science and it must remain so. It is based on two fundamental actions: 1) the act of editing, i.e., the validation the work by peers; 2) the act of publication itself, i.e., the diffusion in the scientific community of this work, a key driver of the progression of knowledge. The act of editing has always been in the hands of scientists and it cannot be otherwise. The act of publishing was historically provided by public academic organisms (Universities, Scientific Societies, Research Institutes etc.). It is now largely in the hands of a few large private for-profit groups (the 'Majors'). The cost of publishing is growing (subscriptions and prices of the gold open-access) and comes into direct competition with the funding of our research. We believe that the current scientific publishing system is in danger, both for reasons related to the publishing and the editing actions. It has changed little since Gutenberg, but the world has changed. It is therefore urgent to take drastic decisions to solidify and perpetuate this pillar of Science.

A new way to publish Science

We recently published a detailed analysis of the current economic model of the scientific publishing system (see Moulia B *et al* 2013¹). The control by the Majors on scientific publishing led to excessive exploitation of knowledge dissemination. In a constrained economic environment, the cost of access to knowledge is such that it is now competing with the production of new knowledge. Some universities, such as Harvard for example, are now refusing to pay the exorbitant subscription costs asked by some Majors (Elsevier in particular). If this phenomenon is becoming more widespread, the shareholders of these Majors may withdraw their capital from this sector in favor of more lucrative ones. There is therefore a risk of a speculative bubble burst (Chilliard *et al* 2013²). Scientific publishing is thus based on a high-risk business model in addition to being very expensive. It is even more vulnerable that alternative models will quickly make it wobble.

Towards a Web 2.0 Scientific Publication

The publication of scientific knowledge in its printed ancestral form is not part of the skills of Academic Institutions and it is not illogical that it has been delegated to private publishing professionals. However the recent advent of computers and of the internet enables a paradigm shift and thus a re-appropriation of scientific publishing by researchers and their institutions.

¹ Moulia B *et al* 2013. *Main basse sur la science publique: Le «coût de génie» de l'édition scientifique privée*. JSPH 1: e0005; <http://herve.cochard.free.fr/JSPH/JSPH-1-e0005.pdf>

² Chilliard *et al* 2013. *La science menacée par une bulle spéculative de l'édition ?* Le Monde 11/11/2013; <http://herve.cochard.free.fr/pdf/Chilliard-et-al-Le-Monde-2013.pdf>

This is the Web 2.0 revolution in scientific publishing. The cost of on-line publishing is very reduced and many operations can be automated or performed by the authors themselves. Private publishers already offer Web 2.0 Publications, without having reduced their prices, making their offers even more unsustainable.

We invite our Institutions to assess a public Scientific Publication Web 2.0 as an alternative economic model to the current private model, by repositioning scientific publication at the center of our concerns and our values. The model of the future will clearly be more 'open'. There is no defensible alternative to a total open access model for readers. Any alternative model is contrary to the free dissemination of knowledge. Scientific publications should also be deposited in open perennial archives, such as HAL or ArXiv. The datasets should also be made public and archived, following the example of the genomics database Genbank. The constitution of meta-databases is a major challenge for future researches and these bases will have to be constitutive of the act of publication.

The cost of publishing for authors should be reduced to the actual cost. Publication can even become completely free for the authors if the Institutions assume this cost of publication. If open-access becomes general, our Institution will stop their subscriptions to the Majors, which will allow them to shift part of this money to public edition. It is clear that this will lead to a profound change in the involvement of the Majors, which will turn to service businesses around scientific publishing.

A new way to Edit Science

The scientific publishing process must also change because the current system, unchanged since Gutenberg, arrives in a dead end. Currently, the validation of scientific work is based on the work of one editor and 2 or 3 referees chosen among our peers. As publishers of scientific journals ourselves, we find a growing lack of interest of researchers for this essential evaluation work. Several causes are at the origin of this disinterest:

- The evaluation work is not rewarding enough for a researcher. It is therefore important that it can make a profit out of it, equivalent to the profit associated with the act of publication. Proposals are made in this direction (see for example the R-index³ initiative);
- The current system lacks transparency and is therefore subject to much criticisms and even abuses. Open-reviewing is an innovative solution to promote. The evaluation of the manuscripts by peers should be on open platforms (see BioRxiv) before their publication.
- Finally, and above all, the current system is clogged and peers are over-committed. We tried to analyze the situation in a recent article (Cochard H, Delzon S. 2015⁴). We identified as the main reason a drift of an editorial system pushed by the Majors to maximize their journal Impact Factor (IF). The IF has become an indicator of the market value of a journal and the race to the IF has perverted their editorial policy (rejection of a large number of original articles, more reviews or meta-analyses etc ..). We propose to substitute the index H5 to IF for journals and reject the use of IF for the recruitment and evaluation of researchers in research institutes in agreement to the DORA initiative. This change, minimal in appearance, change little to the reputation of a journal (and therefore its market value), but radically changes the editorial policy of the journal. Indeed, publishing articles that may receive little citations will not impact the H5 value while strongly impairing its IF. The acceptance of an article can therefore be based only on criteria of soundness, robustness and not on subjective criteria of importance or "sexiness" of the science. This will inevitably lead each journal to publish more articles, which is no longer a

³ <http://blogs.lse.ac.uk/impactofsocialsciences/2015/05/20/passing-review-r-index-to-improve-peer-review-system/>

⁴ Cochard H, Delzon S. 2015. *L'Édition scientifique doit faire sa révolution et mettre à l'index ses indices*. PLAS 8: 3; <http://sylvain-delzon.com/wp-content/uploads/2015/10/Cochard-Delzon-PLAS8.pdf>

constraint in a Web 2.0 scientific publishing model. The disappearance of a large number of journals is also inevitable because the resource itself is limited (i.e., the number of articles). But the recent increase in the number of journals is also an unnecessary drift of the current editorial system.

What roles should be played by Scientific Institutions?

Although researchers are primarily concerned by these editing and publishing issues, the levers to solve them are more in the hands of our Academic Institutions. It is up to them to struggle with the Majors to impose total open-access and negotiate the costs of publications at fair prices. Our Institutions must also promote and support the creation of open publishing platforms. Initiatives are already underway, for example at the University of Bordeaux with the creation of a platform for scientific publishing funded by an IDEX. A concerted approach of these Institutions is desirable because it is not reasonable to multiply such platforms, which would fall de facto in competition. An official office independent of these Institutions could coordinate these initiatives. This may be a mission for our national Academies, like the role taken by the American Academy of Sciences. Lastly, our institutions should clearly abandon any reference to the IF of the journals in its evaluation and recruitment procedures. Signing of the Declaration of San Francisco (DORA) is a strong commitment in this direction as well as the abandonment of the journal classification system based on their IF (Noria). This ranking may remain useful for some researchers to guide the selection of a journal but it must never be used to assess the impact of an article or a scientist in particular.

We note that many researchers around the world are involved in such discussions through publications or blog. You can also read with interest the report of the Academy of Sciences on "Nouveaux enjeux de l'édition Scientifique"⁵, "Declaration of Research Assessment (DORA)⁶", and especially the Force11 Manifesto⁷ which offers interesting possibilities for future edition.

The Scientific Edition is at a turning point in its history. The issue is crucial and our world is changing fast. Scientists Institutions should play a pro-active role in these (r)evolutions and contribute to the maintenance of an effective, sustainable and affordable editorial system.

⁵ http://www.academie-sciences.fr/pdf/rapport/rads_241014.pdf

⁶ <http://www.ascb.org/dora/>

⁷ <https://www.force11.org/about/manifesto>