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## Research

# Steps towards openness and fairness in scientific publishing

Open access is an important topic, but it can be hard to keep track of the requirements by different funding bodies, universities, et cetera. How do you ensure that you are in full compliance in the Netherlands? Jop Briët, David Holmes and Ross Kang give their view on this. Elsevier had been asked to comment on this article, but they declined.

*Step 1:* Add in your journal submission (preferably just before the bibliography) the line: “For the purpose of open access, a CC BY public copyright license is applied to any Author Accepted Manuscript (AAM) arising from this submission.”

*Step 2:* Post the last version of the paper that you send to the journal (the AAM, which is the accepted version without any copyediting or other journal finishing touches) on arXiv as soon as the paper is accepted.

Is this enough? As of 1 January 2021, these two steps ensure that your article fulfills ‘green open access’ (see sidebar Taxonomy of Open Access), and this is sufficient for the open access mandates of NWO and the ERC, for example. This ensures that everyone in the world has timely and free access to (at least a close approximation of) the published version of your article. However, this is only one of the tools that can help achieve a much-needed transformation of scientific publishing; read on to learn more...

### Why is open access important?

For decades the development of technological infrastructure and software platforms has made communication/distribution ever cheaper, faster and easier; it now costs relatively little to set up and sustain a journal. (For an idea of how much it is to run a modern mathematical journal, one can for example consult the open accounting records of the journal *Quantum* [11].) Against this backdrop it is bizarre that most content is locked behind paywall and that prices have steadily increased.

The vast majority of reputable scholarly journal titles are wholly controlled by commercial publishers. The more prestigious the journal, the greater the income that can be garnered — either through library subscriptions or, more recently, through ‘article processing charges’ (APCs), sometimes both. On the other hand, these journals’ reputations are preserved by the tireless and often voluntary editorial/refereeing work of academics, almost all on public payroll. At the same time, libraries and funding agencies have little choice but

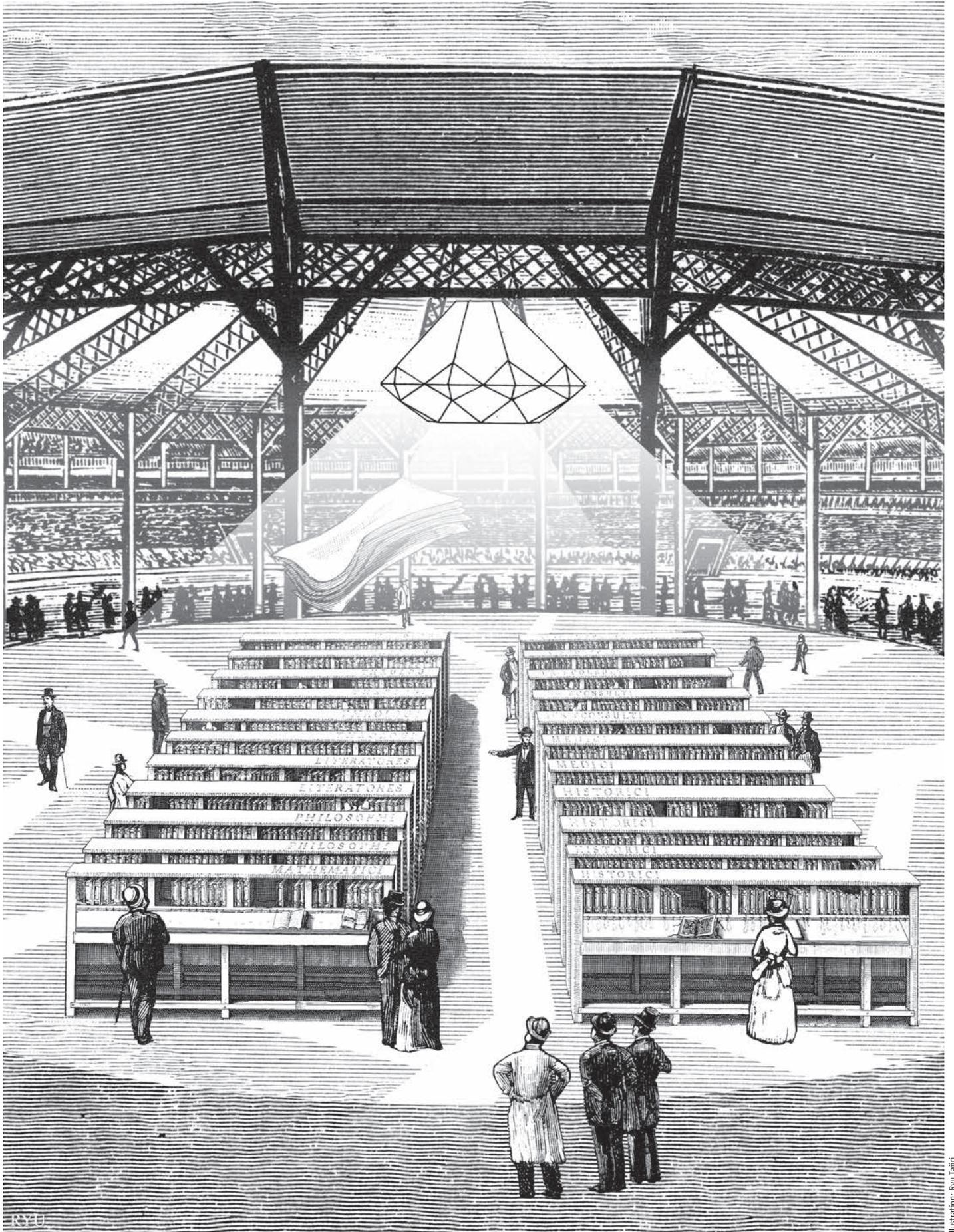
to pay the publishing fees: respectable institutes and researchers simply must have proper access to respectable research dissemination outlets. Moreover, due to the commercial ownership and extreme profitability of these titles, there is little to no competitive pressure on pricing: in simplistic terms, each publisher is an aggregation of monopolies. There is no contemporary parallel to this type of market.

### Taxonomy of open access

*Green:* publishing in a subscription journal while simultaneously posting the last submitted version of the work (the Author Accepted Manuscript) on a public repository such as arXiv.org.

*Gold:* published articles freely available upon payment of an Article Processing Charge (APC) by the authors. Charges range from a few hundred to several thousand euros.

*Diamond:* publishing and reading are both entirely free. Such journals keep their costs as low as possible, but are still not free to run; many are sponsored by libraries or research institutes.



To illustrate how wasteful this has become in concrete terms, let us take a look at one Dutch example of a commercial academic publisher: Elsevier. According to their corporate financial reporting, Elsevier has consistently netted profit margins upwards of 30% (by comparison, Royal Dutch Shell, another financially successful partly-Dutch corporation, typically has had its net profit margins hovering around 5%). Currently, under a so-called ‘big deal’, Dutch universities collectively pay upwards of 16 million euros a year to Elsevier for journal access, meaning, roughly speaking, that an amount of at least around 5 million euros a year is going from Dutch tuition fees and government funds directly to the pockets of Elsevier shareholders. And this illustration considers merely one of several publishers, and only within the Dutch context.

(A prominent campaign, dubbed ‘The Cost of Knowledge’, against Elsevier’s practices in particular was instigated by Tim Gowers, which has led many mathematicians worldwide to publicly boycott their titles.)

### What is Plan S?

Faced with such an intricate situation, one might wonder if one’s ‘mere’ individual efforts have any noticeable impact. Fortunately, systematic developments are afoot. Most prominently, Plan S is a coordinated effort launched in 2018 by a number of European funding agencies (including NWO) to combat unfair, closed practices in scientific publishing.

The open access mandate for NWO-funded research, that took effect on 1 January 2021, is one of the fruits of this labour. This helps to ensure that publicly-funded research is publicly accessible. Note that this mandate prompted our two-step recommendation above for posting your AAMs on arXiv.

Another development is the closing of numerous ‘big deals’ between national

university associations (VSNU in the Dutch landscape) and the largest publishers. On the one hand these deals allow many scientific researchers to publish their articles fully open access without (directly) paying APCs (see [10] to check which titles qualify for Netherlands-based researchers), while on the other hand they commit the publishers to ‘transformative’ actions towards more sustainable and transparent open access ideals.

### What can you do?

Despite these as well as other welcome developments arising from Plan S and its forerunners, there remains much to be gained. Note that even after a full transition as envisaged in Plan S, APCs could remain exorbitantly high. (Given present incentive structures for academics, APC fee transparency does not in and of itself have a positive effect on price.) Indeed, one could aspire further to fair open access ideals; see [9] for a detailed discussion of one potential framework for sustainable and efficient open access in scientific publishing; see [6] for a list of journals adhering to fair open access principles.

From this perspective, there are still ways in which you as an individual can help, in addition to the two steps we outlined at the beginning. We note that those two steps contribute to your ‘good arXiv hygiene’ (already practiced by your mathematicians): consistently post your manuscript to arXiv prior to its submission to a journal, and keep the arXiv version updated through the pipeline. Aside from fulfilling the open access mandate, this significantly improves the visibility and prominence of your hard-fought research. Remind your colleagues, collaborators, and students to adopt such habits.

Read up on the issues around scientific publishing: take some references below as starting points. Talk to your colleagues, librarians, grant administrators, et cetera,

about open access. Educate your students, bring it up at staff meetings, and canvas your university administrators. Curiously, a 2017 worldwide survey on journal reform found that most mathematicians strongly favor change in scientific publishing, but also believe that this opinion is not shared by their colleagues [3]. Fairer publishing models thrive if career advancement is independent of being accepted to commercial ‘high impact’ journals. So lead by example: by supporting and publishing in fair journals, you increase their quality and sustainability. Convince your colleagues, collaborators, department heads, et cetera, to do the same.

If you are in a position to join an editorial board, give preference to a diamond open access or a community-owned journal. If you belong to a board, talk to the other editors about how to make the journal fairer and more open. Organizations like MathOA.org provide assistance (possibly including funding) to flip commercially-owned titles to fair open access models. Many online platforms exist that make starting or flipping a journal much easier than it used to be. And boards of established diamond open access titles are often more than happy to talk about their experiences, so there is no need to reinvent the wheel.

### Closing thoughts

There have long been serious and difficult issues around scientific publishing and open access. Recent efforts and policy changes give hopeful progress. This article has given a brief account from the current outlook for Netherlands-based mathematicians. Although more can be done, we hope that we have collectively passed a tipping point towards more openness and fairness in science. ☞

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