

The future of academic publishing: The chemists' point of view

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Triggered by the developments in electronic communication and the new opportunities offered by the Internet, scholarly publishing is in a transition period. Traditional printed journals have mostly lost their relevance with electronic content taking its place and dominating the picture. Concomitant to these technological upheavals also the preferred business models change. While in the paper world journals were paid through subscriptions from individuals or libraries, in the electronic realm the idea of Open Access (OA), in which scientific publications are available to everyone at no cost to them, is gaining more and more momentum. However, depending on the scientific discipline, the acceptance of new publication models by the scientists and the speed by which such changes are being implemented vary significantly. In chemistry the uptake of OA has been reluctant and the number of publications using an OA model is still significantly lower than in many other disciplines [1].

Nevertheless, also in chemistry OA is of course increasingly becoming an issue, in particular since many funding organizations and political bodies, such as e.g. the European Commission or the Research Councils UK, recommend or even mandate OA publication of research findings funded by these institutions. An important platform for the discussion on OA are the learned societies as they represent the authors as well as the readers. In addition, in many cases, in particular in chemistry, learned societies are also owners and publishers of scholarly journals. As the result of these debates, some of the larger chemical societies have recently issued statements or position papers on OA or have introduced new OA related initiatives in their publishing programs. Prominent examples are the statement “Managing the Transition to Open Access Publication”, which was issued jointly by the European Physical Society (EPS) and the European Association for Chemical and Molecular Sciences (EuCheMS) in November 2013,¹ the announcement of a new OA journal *Central Science* by the American Chemical Society,² or the “Chemical Sciences Article Repository” very recently established by the Royal Society of Chemistry.³

In the following the main focus will be on the position paper “On the Future of Scientific Publishing” which the Gesellschaft Deutscher Chemiker (GDCh, German Chemical Society), has passed in Decem-

¹<http://www.euchems.eu/publications/policy-positions/managing-the-transition-to-open-access-publication.html> (accessed July 2014).

²<http://acsopenaccess.org/acs-central-science> (accessed July 2014).

³<http://www.rsc.org/chemical-sciences-repository/articles> (accessed July 2014).

ber 2013.⁴ However, it should be pointed out that many of the key messages in this paper can also be found in the independently developed EPS/EuCheMS statement.

Apart from being the by far largest chemical society in continental Europe with close to 31,000 members from academia, industry and other areas the GDCh is the owner or co-owner of about 20 internationally renowned scientific journals. This portfolio includes *Angewandte Chemie*, which is one of the internationally leading chemistry journals worldwide, and *ChemistryOpen*, which was the first Gold OA journal founded by chemical societies and launched in 2012. With one exception, which is being published by Springer-Verlag, all these journals are being published by our long-time publishing partner Wiley-VCH.

At the outset the GDCh makes clear that it explicitly welcomes new approaches in publishing as long as these approaches ensure that they serve the scientific community in the best way possible and are based on a solid and sustainable publishing enterprise. The idea underlying Open Access, namely to make the results of publicly funded research available without barriers, including no financial barriers, is to be strongly supported. However, whatever the details of the chosen publication model are, the achievements of the traditional system, which include quality assurance, sustainability, integrity, and adherence to good scientific practice, must be retained. Therefore, the position paper lists a number of aspects which should be considered in discussing the future of scholarly publishing and a possible transformation to Open Access.

A main requirement is that regardless of the technology platform or the underlying business model, the quality of scientific publishing must be maintained. Quality control mechanisms such as peer review are therefore an indispensable ingredient of any publication model and must not be jeopardized. As a consequence, only scientific results which have successfully passed the quality controls should be published in scholarly journals. On the other hand, non-refereed publications, for example on pre-print servers, should be clearly classified as such. In addition, it must be guaranteed that the published version of record of a scientific paper remains accessible and can be located in the long-term. This is of particular importance for those publications which are only available in electronic format. Hence, the corresponding metadata and methods of long-term archival must be available.

Aside from these basic requirements which apply to any publication model and which are probably consensus within the scientific community, the GDCh position paper addresses some other important aspects related in particular to the transfer to Gold OA, i.e. where the article appears in an Open Access journal that is available free of cost to the reader in the Internet. Generally this publication is funded by the authors (or their institute or the funding agency of the research project) by payment of so-called article processing charges (APC).

The most important point raised is that every publication model must ensure that manuscripts that have successfully undergone the refereeing process are published in the journal for which they were submitted and positively reviewed. Non-scientific criteria, such as the ability of the author to pay the article processing charges must not be allowed to play a role in the decision for publication. In Gold OA, mechanisms must therefore be included to ensure that authors have access to the required financial means regardless of their status and career stage or their institution and geographical origin. Both, the GDCh as well as the EuCheMS/EPS position papers describe very clearly the risk that Open Access has the problematic potential to hinder or disadvantage authors which lack the necessary funding, which in turn would lead to significant harm for science. In this respect one should note that the term "Open Access" is

⁴http://www.gdch.de/fileadmin/downloads/Service_und_Informationen/Presse_OEffentlichkeitsarbeit/PDF/open-access2013_en.pdf (accessed July 2014).

very cleverly chosen, since it suggests free access. But this is an euphemism and only true for the readers; for authors Gold OA with APCs is indeed “Toll Access”! Connected to this is an additional aspect, already alluded to above but important enough to be reemphasized: In the traditional, subscription based model the only criterion which decides on the acceptance or rejection of a manuscript is its scientific quality and relevance as judged by the reviewers. In Gold OA a second, completely unrelated criterion enters, namely the financial capabilities of the author (or its institution). This is an unscientific criterion and its usefulness for decisions whether a certain piece of research is getting published or not is at least questionable.

Another issue related to the financial consequences of a transition to OA are the costs of this process. Since in this transition process the two systems, the subscription-based model and the OA model, will coexist in parallel and need funding, the total amount of funding required will be necessarily higher, as for example elaborated for the UK situation in the Finch Report.⁵ These costs as well as the costs for setting up and maintaining institutional repositories in the case of Green OA must not be allowed to be at the expense of existing research funding that was not earmarked to pay for scientific publication. If new publication models are to be funded by public monies, the budgets of the respective institutions must increase correspondingly. Anything else would not be in the interest of the advancement of science.

For non-for-profit learned societies which are active in scholarly publishing, such as the GDCh, the transformation to OA bears another challenge: With a Gold OA business model only published articles produce revenue through the article processing charges. On the other hand each submitted manuscript, whether at the end rejected or accepted and published will generate costs. Hence, in order to cover the costs of publishing, the amount of the APCs must correlate with the rejection rate (i.e. scientific quality!) of the journal. In other words, in the Gold OA world journals are either selective and expensive or inexpensive but less selective [2]! In chemistry, journals published under the auspices of learned societies are typically more selective than those published by commercial publishers. It is questionable whether the high APCs needed to support these premium quality journals will be competitive and whether these journals will remain economically viable in a Gold OA environment. While the “race to the bottom”, which could be the consequence of this economic pressure is a general problem, it has special relevance for learned societies: Unlike commercial publishers, where profits are generated for the benefit of the share holders, learned societies use any surplus received from publishing solely for their statutory charitable activities to support the scientific community, for example by providing travel grants to younger researchers or by subsidizing congresses and other scientific events. The loss of this revenue would have the consequence that scientific societies would no longer be able to provide many important services, to the detriment of the scientific community. As shown by a recent survey carried out by TBI Communications⁶ this concern is shared by a large majority of learned societies. More than 75% of the participating societies named “maintaining revenues from existing publications” as the most significant challenge relating to OA.

But there are more financial imponderabilities of the transition to OA, which need to be carefully monitored. In Gold Open Access the transition requires a redistribution of funding in publishing: At a local level, acquisition budgets of libraries have to be reallocated to the funding of author charges, and regionally and nationally research-intensive institutions must receive more funds for the publication of their results than those that are less research-intensive. For nations with a strong research component, such as Germany, this will result in increased costs. The consequences of these measures, for example for

⁵<http://www.researchinfonet.org/publish/finch> (accessed July 2014).

⁶http://www.edp-open.org/images/stories/doc/EDP_Society_Survey_May_2014_FINAL.pdf (accessed July 2014).

libraries and the provision of literature and information that they provide are difficult to predict. In any case, the complexity of such reallocation of funds and the additional financial burden that it brings in the transitional phase should not be underestimated. As a special issue for chemistry with its large industrial sector, ways should be found that research-based companies in the chemical and pharmaceutical industry, which in the subscription-based model contribute significantly to journal revenues but whose scientists typically use scientific literature without themselves being authors, continue to contribute to the funding in the future. The transition to Green OA also contains imponderables. In particular, the economic consequences for publishers and the secured financing of the setting up and running of repositories are hard to predict. However, successful experience in neighboring disciplines shows that the concomitant risks should be controllable.

Finally, in its position paper the GDCh strongly underlines the freedom of each researcher to decide independently and for themselves whether and if yes in which medium they prefer to communicate their results. This freedom is part of the freedom of sciences as laid down in the German Basic Law and must not be limited. Therefore, the GDCh opposes mandates that force scientists into Open Access publication.

To conclude, while free access to scientific information is fully supported by the GDCh, many important questions in particular with regard to Gold OA still await a final and satisfactory answer, before the GDCh as a learned society committed to the advancement of science can without reservations recommend the Gold OA model. This reluctant view on Gold OA is apparently also shared by the chemical community and is mirrored by the low number of regular (i.e. where the authors pay the APC) submissions to ChemistryOpen, the Gold OA journal published by the GDCh and its ChemPubSoc Europe partners.⁷ Hence, at least for the time being, the GDCh recommends the Green Open Access model to its members, in other words subsequent self-archiving by – after an adequate embargo period – placing the published article on an institutional or other repository where the article will be freely accessible. This approach to Open Access, which is regulated by the newly created section 38 paragraph 4 (secondary publication rights) of the German copyright law, appears to the GDCh to be the most suitable at present for the development of the science and publication landscape.

References

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- [2] M. Leptin, Open access – Pass the Buck, *Science* **335** (2012), 1279.

⁷ChemPubSoc Europe is the partnership of 16 European chemical societies which together with Wiley-VCH publishes about a dozen chemical journals: <http://www.chempubsoc.eu> (accessed July 2014).