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Should Diamond OA be viewed as a threat to librarians?

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Abstract:

Open access has become a growth opportunity for publishers with the “Gold Open Access APC” model and the hybrid model. During the period 2012-2015, these proposals generated a lot of lively discussions.

The Scientific Board of the CNRS (National Center for Scientific Research in France) Institute for Mathematics (INSMI) has made some recommendations to French mathematicians for their publications asking them not to choose the author-pays option for open access, especially for hybrid journals, and not to include publication fees (APC, author processing charges) in funding requests. The rejection of the author-pays model by French mathematicians gives a boost to the development of other economic models of scientific edition, especially the Diamond OA (Gold OA without APC). This new model requires new skills from librarians.

In this paper we present the Diamond OA publishing model, with a stress on the French situation in mathematics, and then explore the problem of how this model could impact libraries and librarians. Everybody says that Open Access is a real opportunity for libraries but we would like to be a little provocative: is Diamond Open Access a threat to librarians?

Keywords: Diamond Open Access, mathematics, publishing models, scientific edition.

Mathematicians have let their work be freely available online since the beginning of the Web. From the creation of ArXiv¹ in 1991, the first repository of e-prints online, they have used it extensively to disseminate their publications.

A noticeable event happened in 2006: Grigori Perelman was awarded the Fields Medal², an award he declined, for a paper that had only been published on ArXiv (without going through a traditional peer-reviewed journal). Though some institutions do not recognize OA publications as scientific contributions, Perelman's proof was accepted by the mathematical community. Another example concerning mathematics is the boycott of Elsevier in 2012, "The Cost of Knowledge"³ launched by the mathematician, Tim Gowers (another Fields Medal winner). These events confirm the importance of straightforward access to scientific documentation for mathematicians.

We present the recent changes occurring in dissemination of research, with a stress on the French situation in mathematics, and then explore the problem of how the Diamond OA model could impact libraries and librarians.

Background

The 2012-2015 period has seen the introduction of Gold Open Access with APC (Author Processing Charges) contracts proposed by Elsevier, Springer, Wiley, and others. These editors have diverted the vocabulary of the OA movement in their favor.

Subsequently, the Finch Report [1] provoked discussions all over the world^{4 5} [2]; the European Commission proposed, in 2012, Open Access with APC funding [3] as an aim of the H2020 program. On similar lines, the strategy envisaged by Berlin12⁶ - "open access business model"⁷, Berlin 13⁸, Initiative OA2020⁹, and other proposals generated lively discussions¹⁰, essentially because the idea of APC payment by the authors or by their institutions comes down to the same thing: to support the Big Deal.

Since 2012, the French mathematical societies, namely the SFdS (French Society of Statistics), the SMAI (Society of Applied and Industrial Mathematics) and the SMF (French Mathematical Society) alerted the French scientific community to the perverse effects of the

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- 1 Repository of electronic preprints of scientific papers in the fields of mathematics, physics, astronomy, computer science, <https://arxiv.org/help/general>
 - 2 The Fields Medals are commonly regarded as mathematics' closest analog to the Nobel Prize (which does not exist in mathematics), and are awarded every four years by the International Mathematical Union. <http://mathworld.wolfram.com/FieldsMedal.html>
 - 3 <http://thecostofknowledge.com/>
 - 4 Open Access Archivangelism by Stevan Harnad. *Finch Report, a Trojan Horse, Serves Publishing Industry Interests Instead of UK Research Interests*. <http://openaccess.eprints.org/index.php?/archives/904-Finch-Report,-a-Trojan-Horse,-Serves-Publishing-Industry-Interests-Instead-of-UK-Research-Interests.html>
 - 5 Parliament UK. *Government mistaken in focusing on Gold as route to full open access*. <http://www.parliament.uk/business/committees/committees-a-z/commons-select/business-innovation-and-skills/news/on-publ-open-access/>
 - 6 Max Planck-Gesellschaft. *Berlin 12 Conference*. <https://www.mpg.de/9789484/berlin12-open-access-2015>
 - 7 Offsetting model, Read & Publish models, Gold OA with APC
 - 8 Max Planck Digital Library. *B13 Conference*. <https://oa2020.org/b13-conference/>
 - 9 Max Planck Digital Library. *OA2020 – The Initiative*. <https://oa2020.org/>
 - 10 According to the study conducted by a group of British universities [4], since 2012 Open Access has become a growth opportunity for publishers. The "subscriptions + APC" coupling agreements signed by the British consortium with 5 major scientific publishers (Wiley, Taylor & Francis, Sage, Institute of Physics, Royal Society of Chemistry) encourages publication in hybrid journals and does not reduce costs of subscriptions.

Author-pays model¹¹. During the negotiations with Springer in 2015, The Scientific Council of the CNRS¹² Institute for Mathematics (INSMI) made several recommendations to French mathematicians, in particular asking them not to choose the author-pays option for open access, (especially for hybrid journals) and not to include publication fees (APC)¹³ in funding requests.

The cost of a journal is linked to its publishing model, and different academic areas have chosen different models. In mathematics, the costs of the subscription model have been widely criticized for some time. But most French mathematicians consider the Gold hybrid model as the worst possible [5] [6] [7] [8].

The Author-pays model (Gold OA with APC) is used in France only in a few disciplines (like medicine and biology) and is generally not very well regarded. APC management does not exist at the institution level. This situation has allowed the development of other economic models of scientific publishing, especially the Diamond Open Access.

Diamond Open Access

Since 2003, an increasing ambiguity between Gold Open Access model and Author-pays model can be observed. Indeed, Diamond Open Access can be seen as “a form of Gold OA that does not include a requirement for authors to pay article processing charges (APC)”; different wordings are being used: “Gold OA without APC”, “Gold no-APC OA”, “Full Gold OA”, “Diamond OA” or even “sponsor-pays”. The definition of Diamond OA given by P. Suber is the following:

In the Diamond Open Access Model, not-for-profit, non-commercial organizations, associations or networks publish material that is made available online in digital format, is free of charge for readers and authors and does not allow commercial and for-profit re-use. [9]

The Diamond Open Access journals have high quality peer review and publishing processes like those employed by “Gold OA with APC” journals. Most of the work is realized by volunteers (individuals or non-profit organizations) to maintain good editorial quality and the organization of the peer review mechanism. Some professionals may also enter this scheme: managing editors and assistants trained and paid for this task.

In 2015, Science Europe¹⁴ published “The Need for ‘Diamond Engagement’ around Open Access to High Quality Research Output” [10]:

The publishing industry is changing and opening up possibilities of creating broader access as long as somebody pays: funder, researcher or user. The ‘Diamond Engagement’ approach uses existing publicly-funded infrastructure, available globally. This infrastructure is used to help change the culture of academic publication where it is to be expected that first publication of research will be in OA digital repositories. The Committee argues for a future where work is ‘born digital’ and ‘born open access’, with no publication fees, no pay walls and no embargoes.

11 French Mathematical Society. *Declaration of the three French learned societies for mathematics*. 2012: http://smf.emath.fr/sites/smf.emath.fr/files/open_access_3_soc-trans.pdf

12 French National Center for Scientific Research. <http://www.cnrs.fr>

13 CNRS. *Recommendation of the Insmi Scientific Council*. [http://www.cnrs.fr/comitenational/csi/reco/Recommandations/INSMI/Recommandation-csi-INSMI-au-sujet-des-frais-de-publication-\(APC\).pdf](http://www.cnrs.fr/comitenational/csi/reco/Recommandations/INSMI/Recommandation-csi-INSMI-au-sujet-des-frais-de-publication-(APC).pdf)

14 Science Europe - an association of European Research Funding Organizations and Research Performing Organizations, based in Brussels. <http://www.scienceeurope.org/>

Since 2016, it seems that policy and decision makers have taken the direction of “more Open” and “more Diamond”:

- The new law for “a Digital Republic” in France¹⁵ gives French scientists the right to make their articles available online after an embargo period of 6 months maximum. This covers scientific, technical, and medical literature (12 months for human and social sciences).
- Joint COAR-UNESCO Statement on Open Access¹⁶ warned governments and the research community of the shift in the model of scientific publication - from subscription to Gold OA with APC model - increasingly promoted by some institutions.
- “Towards a Competitive and Sustainable OA Market in Europe - A Study of the Open Access Market and Policy Environment” [11] identified the steps necessary to remove the main barriers of the transition to Open Access:
 - *Offsetting of subscriptions and open access expenditure*
 - *Strengthening consortia and pursuing collective action (...)*
 - *Development of repository infrastructure*
 - *Support for Gold no-APC platforms*
 - *Improving transparency of publication costs (...)*
 - *A number of existing initiatives also point to a possible future beyond the journal, from both commercial providers (e.g. F1000, ScienceOpen) and not-for-profits/government bodies (e.g. Wellcome, OpenResearch, SciELO)*
- European Open Science Policy Platform¹⁷ follows the Wellcome Trust and the Bill & Melinda Gates Foundation¹⁸ and launches the European Open Science Platform.

The reference [11] is very rich in information about the Gold OA without APC models: *Gold no-APC publication relies on an emerging infrastructure that has three main nodes:*

1. *Gold no-APC journals via consortia or institutional-level funding*
2. *Digital platforms hosting Gold no-APC journals*
3. *Gold no-APC platforms that publish articles directly (such as SciELO) (...)*

Recommendations in this area stress the need to support Gold no-APC platforms and journals, and actively explore new business models. Gold no-APC publishers are considered non-profit players and are expected to play an increasingly important role in the future, but will need support from supra-national institutions to become fully established.

This analysis presents also the publishing Diamond OA models, their transition from scholarly journals to open platforms. Gold OA without APC journals rely on subsidies from learned societies, research funding organizations or library consortia such as SCOAP3¹⁹, Open Library of Humanities or Knowledge Unlatched²⁰.

15 Legifrance. *Article 30*. https://www.legifrance.gouv.fr/eli/loi/2016/10/7/ECFI1524250L/jo/article_30

16 Unesco. *Joint COAR-UNESCO Statement on Open Access*. http://www.unesco.org/new/en/communication-and-information/resources/news-and-in-focus-articles/all-news/news/joint_coar_unesco_statement_on_open_access/

17 European Commission. *European Open Science Policy Platform*. 2017 <https://ec.europa.eu/research/openscience/index.cfm?pg=open-science-policy-platform>

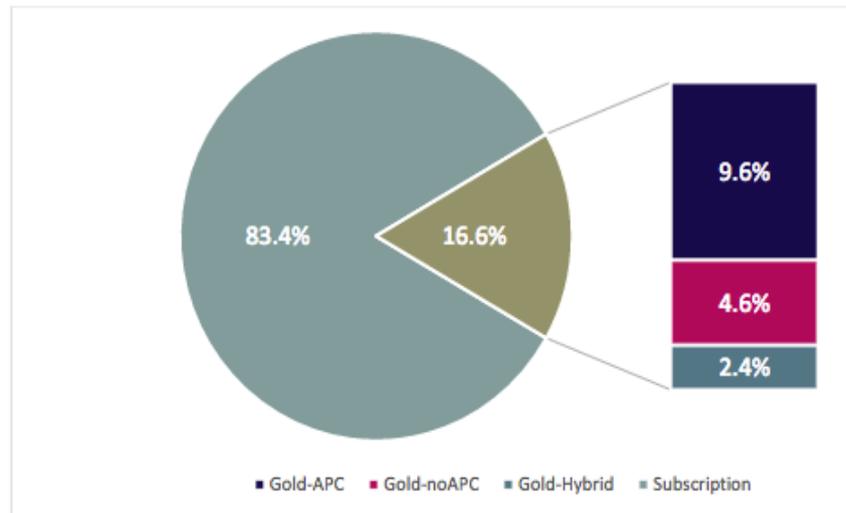
18 Bill & Melinda Gates Foundation. *Gates Open Research*. <https://gatesopenresearch.org/>

19 Scoap3. <https://scoap3.org/>

20 Knowledge Unlatched. *About us*. <http://www.knowledgeunlatched.org/about-us/>

According to this study, for the moment a significant percentage of the journals will remain subscription-based.

Figure 2. Market share of different publishing models (as percentage of global articles, 2014)⁵⁶



A mixture of Green Open Access and Gold Open Access will remain for some time. The proportion of Diamond Open Access will increase following the official recommendations. It's possible that substantial parts of academic publishing will move to this economic model; the existence of Diamond OA journals will have a restraining influence on the pricing of APC. Overall, the Diamond OA model will stimulate the discussion about the development of policies that will facilitate and accelerate the transition towards full Open Access.

Diamond OA in mathematics in France

The three main nodes of Gold no-APC publication, presented in this report [11], exist in France, but only two of them are present in mathematics:

- Gold no-APC journals via institutional-level funding
- Digital platforms hosting Gold no-APC journals

The mathematicians in France would like to have also the third node: a “*Gold no-APC platform that publishes articles directly*” like SciELO²¹ (**Scientific Electronic Library Online**).

Diamond OA mathematical journals have existed for many years²². Some of them are full Open Access from the start, like the “North-Western European Journal of Mathematics”²³ or the “IJFV International Journal On Finite Volumes”²⁴; some others have changed the economic model removing subscriber fees thanks to institutional grants (like “Annales de l'Institut Fourier”).

21 SciELO Network is a decentralized national collection of journals. Each national collection replicates the platform. Today, there are 15 national collections, totalling more than one thousand journals from the different disciplines which publish about 50 thousand articles per year: <http://www.scielo.org/php/index.php>

22 Lille University. *Diamond Open Access Journals*. <http://math.univ-lille1.fr/~nwejm/diamondMathematicalJournals.html>

23 Lille University. *North-Western European Journal of Mathematics*. <http://math.univ-lille1.fr/~nwejm/>

24 The International Journal on Finite Volumes. <http://ijfv.org/>

The Diamond open access model requires policy measures, material support but also financial means. The BSN²⁵ (French Scientific Digital Library) recommends some methods of financially supporting Diamond OA journals [12]:

- *Transforming certain expenses into investment ... This investment could take the form of an innovative 1%: all transactions (subscription renewals, APCs, etc.) would include a small levy to finance new models.*
- *Developing subsidies that are appropriate for not-for-profit entities ...*
- *The introduction of micro funding mechanisms with minimal administration ...*

In France, as in many countries, government provides small subsidies to scholarly journals. Public institutions have decided to develop existing digital platforms and to fund existing academic journals by facilitating their transition to the Diamond open access model. In particular, the INSMI (CNRS Institute for Mathematics) subsidizes some academic journals and supports editorial numerical platforms, like Cedram²⁶ or Epi-Journals²⁷ (starting January 1st, 2017 all Cedram journals are Diamond Open Access²⁸).

The new project “Le Centre Mersenne”²⁹ (The Mersenne Center) is intended to convert “Cedram” - the largest French digital platform hosting Diamond OA mathematical journals, into a digital publishing platform providing a complete editorial infrastructure. It is going to include legal domain support, OJS³⁰ technical support and development, DOI assignment, editorial secretariat, standards (LATEX, bibTEX) upgrading, digitalization, archiving and print on demand³¹. The aim is to integrate new Diamond OA publications from all scientific fields (French and international) written in LaTeX³².

Also to be mentioned is the “Episciences-Maths”³³ project of the Overlay Journal Platform³⁴, hosted by the CCSD³⁵. Currently 10 journals³⁶ are made up of articles present in HAL, ArXiv or CWI (Centrum Wiskunde und Informatica). Episciences provides a technical platform of peer-reviewing and while each journal has its own website, the articles are hosted in the main archives.

25 CNRS. *BSN (French Scientific Digital Library)*. <http://www.bibliothequescientifiqnumerique.fr/>

26 Cedram. *Presentation of CEDRAM*. <http://www.cedram.org/spip.php?rubrique3&lang=en>

27 Episciences. *Maths*. <https://www.episciences.org/page/epimath>

28 Cedram. *Browse CEDRAM collections*. <http://www.cedram.org/spip.php?rubrique4&lang=en>

29 MathDoc. *Le centre Mersenne pour l'information scientifique ouverte (Mersenne Center for open scientific information)*. 2017. http://www-mathdoc.ujf-grenoble.fr/centre_mersenne

30 PKP. *Open Journal Systems*. <https://pkp.sfu.ca/ojs/>

31 MathDoc. *Le centre Mersenne : services*. 2017. http://www.mathdoc.fr/centre_mersenne_services

32 The Latex project. *LaTeX – A document preparation system (used in mathematics)*. <https://www.latex-project.org/>

33 Episciences. *Maths*. <https://www.episciences.org/page/epimath>

34 The idea of an 'overlay' journal that links to papers hosted on a preprint server is not new. There are arXiv overlay journals in math, such as *SIGMA* or *Discrete Analysis*.

35 Center for Direct Scientific Communication (CNRS), developing the open archive "HAL": <https://www.ccsd.cnrs.fr/en/>

36 Episciences. *Journals*. <https://www.episciences.org/page/journals>

What about libraries?

The “Green OA” model gives libraries the opportunity to assume the functions of open access service provider (archive management) and advisory service for new methods of scientific communication.

Concerning **the “Gold OA-APC” model**, the institutional recommendations supporting it say that Open Access with APC management is a real opportunity for libraries. According to OA2020 Roadmap of the Max Planck Digital Library³⁷:

The transformation must start with the libraries. Libraries are also predestined to be the organizers of the cash flows in an open access publishing system, because they have the skills, the experience with publishers and the staffing to take care of the necessary administration.

For Knowledge Exchange³⁸, “Libraries have a very important and central role to play when it comes to monitoring of publications and cost data” [13]:

- *Libraries should be very specific about their requirements from publishers and use the contracts with publishers as instruments to obtain what is required. ...*
- *Libraries should collect as much data as possible and ensure the data is open (via API) and findable, accessible, interoperable, and reusable (so-called ‘FAIR’ data)*
- *Libraries could be used as centralized OA funding offices regarding payments*
- *Libraries should require transparency in all costs related to everything that has to do with publishing and they should not enter into non-disclosure agreements*

Concerning **the “Gold OA without APC” model - (Diamond OA)**, official documents and recommendations supporting it address mostly two audiences: scientists and policy makers, but they recognize the role of libraries.

The Public Knowledge Project³⁹ (PKP) launched a survey on cooperative models in scientific publishing⁴⁰ involving libraries:

The goals of the Open Access Publishing Cooperative Study for the next two years include:

- *gathering data from journals and organizations to create a business model and/or to participate in pilots of cooperative publishing with libraries;(...)*
- *develop open source infrastructure for conducting co-op pilots to assess journal efficiency and quality through cooperative publishing on a global scale.*

37 Max Planck Digital Library. *OA2020 Roadmap*. <https://oa2020.org/wp-content/uploads/pdfs/OA2020-Roadmap.pdf>

38 Knowledge Exchange. *About us*. <http://knowledge-exchange.info/about-us>

39 PKP. <https://pkp.sfu.ca/>

40 PKP. *About the Study*. <http://oa-cooperative.org/about.html>

Let us note that LIBER⁴¹ is satisfied with the “Amsterdam Call for Action”⁴² which recognizes the role of libraries in various steps of the plan and proposes to strengthen it, especially in new models of scientific publication, in assessment methods and infrastructures⁴³.

Libraries should take a proactive role in stimulating new publishing models, not only providing funds for APCs or as institutional publishers but actively exploring and experimenting with new disruptive publishing models that will be made possible through the opening up of the research lifecycle.

Indeed, OA development started with libraries, IT support and editorial communities, but the next step, according to “Putting down Roots”, JISC, [14] is more delicate and needs widespread adoption of Diamond OA policies. Under the Diamond OA model, attention should be paid to information sharing and knowledge management in libraries.

What about librarians?

Let us come back to whether Diamond OA should be seen as a threat to librarians.

The traditional librarian activities like selecting, acquiring, cataloguing, classifying and managing long-term access to digital publications still remain. But libraries and librarians are likely to be very different in the future. Recommendations supporting the Diamond Open Access model involve libraries, as well as librarians. Both must evolve in their roles, responsibilities, profiles and workflows. As the librarian’s profession transforms to respond to an increasingly high-tech environment, the skills embodied by library professionals are necessarily changing. Evolution of this profession is marked by versatility: multi-skilled staff and/or pooling of staff is required.

The important question here is: how can librarians find their place within the Diamond OA model?

This model transforms publishing work into a public service job; it needs library professionals, but in rather limited quantity and with editorial skills; some librarians have already evolved into support of scientific edition (by providing metadata, copyright agreements, etc.).

Others participate in the description of the Diamond OA resources, selection and identification of relevant and authoritative information, thesaurus and metadata management, and communication. They also take an active role in training scientists on the emerging technologies, alternative publishing and author copyright models or dissemination of scientific results. So, they perform exactly the same tasks as in the other economic models.

Esther Hoorn, analyzing the role of librarians in the support of a shift towards Diamond Open Access in the legal domain and the beginning of the researcher-librarian collaboration [15], says:

41 Association of European Research Libraries. <http://libereurope.eu/>

42 The Netherlands EU Presidency. *Amsterdam Call for Action on Open Science*. <http://www.openaccess.nl/en/events/amsterdam-call-for-action-on-open-science> and <https://f.hypotheses.org/wp-content/blogs.dir/1244/files/2016/06/amsterdam-call-for-action-on-open-science.pdf>

43 Liber. *LIBER Response to the Amsterdam Call for Action*. <http://libereurope.eu/blog/2016/05/17/liber-response-amsterdam-call-action/>

A skills gap is identified in the knowledge to support researchers in complying with various mandates of funders, including open access requirements. Librarians should liaise with staff to understand their needs in the whole research process. An understanding of the general needs in becoming an established researcher as well as discipline specific needs is required. In general there is a need for librarians to become more involved in the research process. Involvement of the library in open review projects would be an ideal way to learn 'on the job.'

At the moment librarians learn many things “on the job” but new activities require the acquisition of several new skills, especially for the researcher-librarian collaboration⁴⁴. These new skills include intellectual property legal support, copyright agreements, editorial policy, licenses or standard contracts for sharing and dissemination, social and communication skills, etc. To become more involved in the collaboration with scientists, librarians need better knowledge of the research process, of the scientific environment and of the discipline-specific needs.

Librarians need also to acquire knowledge and technical know-how in the IT area: they need to know several computer tools, computer vocabulary, open source and free software, technical skills to manipulate APIs (Application Programming Interface), code, programming, web services to be able to support editorial platforms and their infrastructure or adapt some IT tools to the needs of users. The idea is not to provide full IT support but a bridge between IT specialized technicians and scientists, and to ensure that the output be usable for archiving and referencing purposes.

The big university libraries are organized in departments specialized in communication, open access and community archiving, knowledge management, records management, publication process and digitization of cultural and academic resource materials, editorial policy, licenses, computer centers and electronic publishing support services, electronic content management, etc. The staff of each department has some specific tasks.

In small research libraries, the librarians are involved in all these areas in addition to their classical tasks and they become as multi-skilled as they are able. To this end, research librarians collaborate through shared services and operate in networks, like the RNBM⁴⁵.

Conclusion

The difference between economic models of scientific edition is mostly financial.

Economic and editorial changes take time, but the transition towards full Open Access accelerates.

In the case of the “Gold Open Access with APC” model, subscription management will converge towards APC management monitoring by libraries.

In the case of the “Gold Open Access without APC” model, if decision makers wish to follow the BSN recommendations concerning financial ways to support Diamond OA journals: “*Transforming certain expenses into investment*”, they may ask for some part of the libraries' budget to be placed into a common fund run by one foundation dedicated to funding an editorial platform facility.

44 The recruitment of professionals on new profiles and supports is not sufficient, so librarians have to adapt their profiles to the needs related to Diamond Open Access

45 Réseau national des Bibliothèques de Mathématiques (*French National Network of the Research Libraries of Mathematics*). <http://www.rnbnm.org/>

It's possible that the next step in gathering funds is cutting positions, reducing staff, or even closing existing libraries⁴⁶ to ensure digital edition financing.

In the worst-case scenario, subscription budget and employment budget will be used for funding digital editorial platforms. But sustaining Diamond Open Access should not bind librarians to look for job change opportunities (don't forget: for the moment this is only 5% of global articles).

While librarians think about their future, the lack of any actual project involving them is disquieting. A joint plan of action (by scientific area) for library professionals is strongly missing and national networks of libraries are to be involved in projects for Diamond Open Access.

Otherwise, librarians not ready to radically alter their job are destined to fade away like a memory of a time gone by.

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46 All physical libraries of INRIA (the French National Institute for computer science and applied mathematics) were closed in 2014 except the main one

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