

A basis for discussion on a position of the EMS on Open Access

Prepared by the Publications Committee of the EMS

Executive summary

Making the results of research freely accessible to all as quickly as possible is of course desirable. Financing this Open Access (OA) by Article Processing Charges (APC) is the least imaginative solution and is very dangerous, scientifically as well as financially. The EMS, with as many other learned societies and institutions as possible, should strive to establish sustainable alternatives which respect a set of principles and good practices for scientific publication, some of which it can share with other disciplines. In particular the financing mechanism of scientific publications should be at least partly dependent on the scientific judgement of the end users, as opposed to a “supply side economy” of knowledge which is extremely costly. Here one must distinguish clearly between diffusion of knowledge and ideas, such as what is offered by the ArXiv and which of course cannot be anything but “supply side”, but does not cost much, and publication which has much stronger constraints, such as validation, long term availability, construction of a searchable corpus of validated results, etc. The peer reviewing system for publications is still entirely necessary, but no longer sufficient to guarantee quality as shown by the explosion of “peer reviewed publications” which are in fact little more than glossed over diffusion. If nothing is done, many of the new electronic OA journals may in fact create of a vast “grey zone” between diffusion and publication. The importance of the role of research libraries in evaluation, organization, and preservation of scientific documentation should be maintained and they should be given the means to finance the journals (not bundles) and series of books which their users think should be supported. Scientists must provide their libraries with their expertise, in order to prevent evaluation by bibliometry alone, and help them to adapt to the new environment. A learned society such as the EMS should stress that the evolution of the systems of diffusion, of publication, preservation and of evaluation of the results of research must be considered as a whole, as well as its financing. It is insufficient to argue over the shades of OA financing, especially in an environment where a very active “Gold OA” lobby strives to convince stakeholders that APC is the only solution and to evacuate all the other issues such as preserving quality and long term access.

The situation

The EMS has to take position on all the aspects of dissemination, long term preservation, and evaluation of mathematical production, while the very definition of that term is evolving, with sources whose only support is the Internet: mathematical blogs, forums, Wikipedia and Mathoverflow articles, etc.

The position must be compatible with the widely shared wish that the largest possible part of the results of research, and at least the part that is publicly funded, should be made freely and openly (with explicit permission for re-use) available to

all as quickly as possible, at a cost to the community as low as possible. Apart from the need for new economic models of OA itself, the very possibility to publish on the Internet gives a new intensity to questions such as preventing the explosion of “publications” of low quality, and devising ways to help researchers and the public to find the information they need in the avalanche of available data.

Commercial predatory publishers are already active in OA publication of low quality papers paid by “Article Processing Charges”.¹ One also observes the growth of commercial scientific data mining companies which offer their expensive services to academic institutions². These data mining companies also serve as visibility merchants to these institutions since their activity produces or harvests ratings by impact factor or similar numerical and easily falsified data³. Unfortunately, the same data are also used in various evaluation processes, especially in environments which do not have a strong scientific tradition and a body of experts on whom they can rely to offer scientific judgement to counterbalance the defects of numerical evaluation. The IMU has already taken a firm stand on this issue (see www.mathunion.org/publications/report/citationstatistics0).

There is a dangerous drift towards an ecosystem where the institutions, and ultimately the taxpayers, who fund research also pay for its publication in OA in an APC system, and pay again (through visibility-greedy academic institutions) to visibility merchant companies for the evaluation of research by bibliometric methods and one more time to let their researchers access commercial data mining systems. This is accompanied by an explosion of OA publications, especially mediocre-to-bad quality ones, which for some makes it all the more necessary to have recourse to bibliometric evaluation, however unreliable it may be. The taxpayers’ money is used to fuel an explosion of the number of publications and the use of data mining companies and bibliometric evaluation, with a low effectiveness/cost ratio for scientific value. Remember that much scientific literature is already available on open access archives, although a significant proportion of authors in Mathematics, for various reasons, do not put their preprints on the ArXiv. At the same time, libraries stop being funded by Universities who question their usefulness at a time when “everything is available in OA or in the bundles of commercial publishers” and prefer to use a part of the documentation money not devoted to acquiring bundles to pay the visibility merchants (this is already happening). Academic publishers of journals suffer more and more, although in mathematics they are often among the best. They face an uncertain future since they are not in the bundles more or less blindly bought by libraries and have difficulties making the heavy financial and human investments necessary to adapt to the changes.

There are ominous signs which indicate that it is urgent to react. For example the large commercial publishers are already buying or creating academic data mining companies and now say openly that they expect to make a large part of their profit

¹See “Predatory publishers” on Wikipedia.

²See “Academic Analytics”.

³As Winston Churchill wisely said: the only statistics you can trust are those you falsified yourself.

from that activity in a few years. On the positive side, one can point to many initiatives going in the other direction, for example free e-journals of good scientific quality. Yet the long term future of these initiatives, which often depend on the enthusiasm of a few individuals, would be better guaranteed in a sound ecosystem. Another positive sign is that the scientific dangers of bibliometric evaluation have become so visible that biologists initiated the San Francisco Declaration On Research Assessment (DORA)⁴, and the need for new models of publication and referencing has led biologists to create PLOS One (with moderated APC (for now) and impact computed for individual papers⁵) and PubMed (which gives free access to the public biomedical referencing base Medline). But the effect of PLOS One has not yet proved to be decisive in changing the landscape, and biomedical sciences still pay very large sums of money to the shareholders of a few companies in a system where more and more papers are retracted. The importance of publishing in “Elite” journals is grossly overrated, as the 2013 Nobel prize winner Randy Schekman (Physiology and Medicine) pointed out. Some of these journals can charge outrageous APC’s because publication under their title almost guarantees that the authors obtain a grant which, in the biomedical sciences for example, is of a magnitude incommensurable with the publication charges. But this gives immense scientific power to a few editors and referees, which is difficult to accept in principle, and is probably not sustainable anyway.

It seems useful to try to formulate a clear alternative to the drift mentioned above, at least as far as mathematics are concerned.

In mathematics, fortunately, the situation is not yet so disastrous, we still have a strong not-for-profit publishing system, but its share in all mathematical publications is dwindling and its adaptation to OA is difficult. At the same time evaluation of institutions, journals, and researchers by impact factors with little or no intervention of scientific judgment is gaining ground, and the funding of libraries is decreasing in many places.

If mathematicians are to preserve a system of publications which satisfies their specific needs for long range bibliographical search, long term preservation and accessibility of a reliable corpus, quality control and evaluation by the users and scientists and not by rating agencies, and cost moderation, it appears that a strong reaction is necessary.

But such a reaction can only come from the mathematical community and it must, as much as possible given the special features of mathematical documents, not be isolated within the global research community. For example the opinion about evaluation by bibliometry, which is poisoning science, is now rather widely shared. One can begin with some simple ideas and recommendations.

⁴See am.ascb.org/dora/

⁵See www.plosone.org/static/information

Recommendations

- In this time of change, it is of course difficult to see where the system is going. But this is in part because in spite of thousands of reports, articles, etc. on OA it seems that there is little reflection on where we really want to go, especially from the point of view of preserving the quality of publications in a “supply side” economy of documentation and ensuring, as much as possible, that what is now in free access will still be in many decades. The fear to be left behind in the race for publication in OA, fueled by an energetic lobby of publishers and some politicians, seems to have hidden the need for that reflection by causing some stakeholders to loudly claim that the only solution is OA by APC and thus concentrating the discussion on the color (Gold, Green, Platinum) of OA, and its financial aspects, when it is the whole system that is changing *while the ultimate sources of financing, public funding or industrial contracts, do not change*. In particular, we feel that although editorial boards and referees are still necessary, they are no longer sufficient to ensure that journals publish quality papers in a way that is compatible with the long-term interest of science. The creation without moderation of many OA journals would tax even more an already dangerously burdened refereeing system. The fact that in mathematics referees are not paid is a precious asset for the scientific integrity of the system, and should be preserved.

The EMS can, perhaps with other learned societies, strive to establish a charter of good practices in publication which concerns all aspects of publishing, from the peer reviewing system to the contribution (sharing meta-data, etc.) to the creation of a searchable scientific corpus, depositing of papers on an openly accessible archive after a reasonable embargo period and guarantee of free long term access to the published papers, within a sustainable economic model, for which there may be several choices. In any case, a code of good practice should impose that whenever public money is involved in contracts with publishers, these contracts should be entirely public. It should also prevent the sales of uncontrollable bundles, whose continuing growth without quality control by the users is used as an argument for high price increases. The EMS Code of Practice should of course be part of it. In some countries like France, a code of practice for all scientific electronic publications is being put in place. (in France, by the BSN: <http://www.bibliothequescientifiquenumerique.fr/>, see BSN7). At the same time the EMS should strongly encourage mathematicians to store a version of their research results in a freely accessible archive such as ArXiv or an institutional repository giving “Green OA”, but this is not publishing.

- An OA economic model in mathematics where publication is paid for by researchers or their institutions would be acceptable by researchers only if it was completely transparent for them, without need to apply for funding for it, or even to ask some authority for permission to submit a paper, and

that is not going to be the case, simply because if mathematicians accept the APC business model, they will have to follow the APC model of other disciplines where it is already established. Besides, this model encourages the publication bubble, and the honest publishers who might adopt it would justify the existence of predatory ones and a growing “grey zone” of APC publishers, not obviously predatory but whose status is difficult to determine, and which may attract young researchers to a documentation dead end. The EMS, with as many other research-oriented institutions as possible, should take a strong position that it considers a move towards APC-funded publications as very dangerous and that it seeks alternatives.

Journals will continue to exist for many years. However the creation of journals has become so easy that we are witnessing the growth of a documentation bubble which will have very serious scientific consequences. Scientific publication must not become a supply side economy. It is very important that some control remains with the researchers: as end users, they should be able to support the publications which they deem useful. This permanent questioning by scientists is a challenge to routine which is necessary to preserve quality in the long run. A new model for funding, which already exists and is successful in the Humanities, should incite libraries, consortia of libraries such as the RNBM in France, research networks such as the Max Planck Institute and even entire countries (as France has done for the EMS and SMF journals), to subscribe to journals for the services they render, in reviewing, editing, contributing to the creation of a corpus, depositing documents in free access archives in a way compatible with search engines, ensuring long term preservation, etc. All this in the respect of a charter giving guarantees of scientifically sound management of submitted papers, respect of the authors’ rights, etc. Alternatively, Universities or other institutions could entirely finance journals for the same reasons, but a system where financing is at least partly dependent on the opinion of several institutions seems preferable.

Note also that very interesting alternatives are developed in some countries. For example SciELO, in Brazil (scielo.br), is now used in most of South America.

- The EMS should recommend to other learned societies and institutions to make lists of publishers that are to be supported in the manner just described by the community and the funding institutions. This would help to stabilize the publishing system more efficiently than the rapidly obsolete lists of “predatory publishers” one finds on the Web. Perhaps the bureaucrats need a ranking of journals for their “evaluations”, and scientists too indulge in some ranking because it is a basic need of the human mind, but what the

scientists really need is a list⁶ of journals that are well run, respect a code of practice and in particular can guarantee open access after a reasonable embargo as well as long term availability. The list we have in mind can of course contain journals published commercially and this would put pressure on commercial publishers⁷. But this support will be efficient only if it entails sufficient financial support as well as scientific support with refereeing, editorships. And of course it should be attributed on the basis of judgment by mathematicians not involved in the journal.

Some scientists maintain that the more mathematical papers are available on the web, the better, and one should impose no restriction, just a ranking. We disagree, not out of a need to control, not even because we think rankings are noxious, but because this is a short term view: many of the papers now being published by new OA journals will probably not be available in 50 years, simply because the journal will have ceased to exist and no one will want to pay for the reprocessing of the files. It is our duty to support the “real” publications with a long term approach. There have always been publishing houses which offer authors the possibility to publish their works by paying, but until now this concerned frustrated authors of novels or of non-fiction, not publicly funded research work.

The EMS should support those economic models which condition financial support to scientific judgment and this would save a lot of public money.

- The EMS should induce its member societies and individual members to contribute energetically to the adaptation of mathematics libraries (or the mathematics section of academic libraries) to their new roles: Libraries will continue their traditional role of helping researchers (especially students) to find the documentation they need, but in a much more complex environment, which will require the use of complex tools. In the other direction, libraries should continue, in collaboration with mathematicians, with their role of selecting which publications (and blogs, forums, etc.) are worth keeping in their searchable universe. Endorsement, based on quality estimates by mathematicians, of several library consortia and research institutions, or of learned societies as mentioned above, would be a measure of quality less falsifiable than impact factor, and the endorsers should have the financial means to support those journals which have sufficient scientific quality and provide sufficient guarantees of scientific integrity, interoperable archiving, long term preservation, etc. Of course it is advisable for the EMS to support the development of global mathematical libraries as proposed in the report [http : //www.nap.edu/catalog.php?record_id = 18619](http://www.nap.edu/catalog.php?record_id=18619), but in our opinion

⁶This list should run into the hundreds, while the adepts of ranking can think of at most a few dozens of “elite” titles and all the others are in fact at the same level unless you use the meaningless ordering provided by the impact factor.

⁷It is remarkable, and frightening, that in negotiations with commercial science publishers scientific arguments, for example judgements on the quality of journals (not impact factors) are very seldom heard.

it is urgent to act on specific issues such as APC's and the quality of publications. While the idea of a world DML has generated a lot of literature for more than a decade, it is only a more modest approach via the miniDML and EuDML that is now gaining momentum.

- The EMS should incite research funding agencies at all levels, including the ERC, to become concerned with the future of documentation and the control of its costs. It should also try to convince governments to make it an obligation for Universities and research institutions to remember that in addition to OA they have a duty of organized preservation of knowledge which is only very partially fulfilled by helping their researchers to put papers and data in OA. Therefore they have to provide sufficient funding for libraries and help them to adapt to their new roles. This funding can be provided in part by research contracts with National or European research agencies provided this is incorporated in the contracts. Specifically, a substantial percentage of the overhead attributed to Universities in these contracts should go to libraries for documentation. This would give libraries the means support financially the publications deemed to be interesting enough by researchers. At the same time, the research contracts and academic institutions should not encourage in any way paying for publication in the field of mathematics.
- In mathematics the existing systems of preservation of electronic documents (such as LOCKSS) do not seem to guarantee free access over the many decades which the subject needs. The cost of reprocessing documents to adapt them to new operating systems of the future is unknown. For the moment, preservation of a few archiving quality paper copies seems the only really trustworthy and relatively inexpensive method, as it will become an important but globally much less time-and-space consuming activity of libraries. At the same time, it is necessary to create a stable network of interoperable electronic archiving systems and render obsolete the quarrels about whether to archive in an institutional, national, or international archiving system. It is also necessary that mathematicians use this network to archive their preprints, and again the EMS should encourage them to do so.
- Impact factors are now understood to have a noxious effect on the evaluation of journals, institutions and researchers. It tends to take the place of scientific judgement, especially in environments where obtaining reliable judgement requires external help. Ideally, mathematical publications should be evaluated according to the rules proposed by DORA and the EMS Code of Practice. The EMS should encourage its individual members and member societies to read the declaration and sign it, and at the same time energetically publicize the Code of Practice elaborated by its Ethics Committee. Again, libraries can be used to gather and transmit the judgement of the end users on various sources of documentation as an alternative, or at least an indispensable complement, to bibliometric evaluation.
- Concerning data bases and data mining activities, what is taking shape globally does not seem well adapted to the needs of the mathematical community.

We have in Europe a very good basis on which to build a system adapted to our needs, namely the Zentralblatt Math. (ZbM) which is run, as far as science is concerned, by scientists, and is strongly supported by the EMS. We also have several digital libraries and in particular CEDRAM, EUDML, and sources of expertise such as the MathDoc cell in France. The EMS should continue to take a strong position to favor the rapid development of ZbM and of an interoperable network of archives, with the help of its EPC. The aim should be that ZbM enlarges the scope of its activities from being a reference database to being also a strong and scientifically reliable search and data mining instrument for all kinds of mathematical documentation, informations about mathematicians, forums, etc. This evolution has already begun, but it should be accelerated as much as possible.

- The EMS should support free access to mathematical papers and data, including metadata, with no restriction on re-use, but only for non-commercial purposes, in the spirit of the Creative Commons. Just as for texts and data, the use of metadata by data mining or bibliometry companies for commercial purposes should be subjected to the authorization of the journals or societies which created them, and possibly to the payment of royalties if that is legal. This point is perhaps in contradiction with the wish of universal access to metadata but it is important for the future to distinguish commercial and non-commercial use of data that are created by public funding. In the end it may be that the best solution is indeed to make all metadata freely available to everyone but for the time being not-for-profit publishers should if possible reserve the right to do otherwise.
- EMS PH: The EMS PH can immediately begin to seek support by national subscriptions or subscription by consortia of libraries or funding agencies, with a description of its editorial project, its respect of a charter of good practice, beginning with the existing one, of course, but including also technical aspects. It can also seek to improve the quality of refereeing by organizing, with other academic publishers (for example the SMF, the LMS) a system of recognition of excellent refereeing as suggested in the editorial of the September 2013 EMS Newsletter. The EMS PH should also move towards deposition of *all* the articles it publishes on an Open Access archive after an embargo period.
- The EMS should make its position known to other societies, publicize it, write to EU authorities and all institutions concerned with mathematics, but also to libraries. Librarians, and not only Mathematics librarians, often feel isolated in defending their position towards documentation. The aim would be to create a group of stakeholders, with learned societies, research institutions and libraries (like the RNBM/CNRS in France) of as many disciplines as possible, to formulate and support a scientifically and economically sustainable alternative to the APC/datamining/bibliometry system supported by commercial publishers for reasons which in many cases have more to do with increasing rent than with developing science.

Concluding remarks: The evolution of the documentation system is difficult to predict, but it is urgent to state principles which the evolution of the publication system should satisfy: no APC's, and publication (not diffusion) should not be a supply side economy: financing should depend at least partly on the respect of a charter of good practices and the scientific judgement of the end users. Libraries should be strongly supported as an essential tool to concentrate scientific judgements and ensure long term preservation and intelligent data collection for students and researchers.