

# Freedom for Scholarship in the Internet Age

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OCULA Spotlight

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Greetings from Vancouver. Snowless Vancouver. Not exactly optimal weather for a city that is hosting the winter Olympics – but it is just about perfect for one of my favorite sports, walking about taking pictures of pretty flowers, like these crocuses here. This can be a surprisingly dangerous sport, especially when there are hills involved – but that’s a story for another time.

This morning I want to talk about freedom for scholarship in the internet age. First, we’ll have a brief look at what is this scholarship stuff is all about; what’s the point. Then, speaking as a scholar, I’d like to share some thoughts about what the internet can mean for scholarship. We’ll look at a window of opportunity that we librarians are helping to open up, to transform scholarly communication for the internet age. We’ll talk about about how we transition to a scholarly publishing system that makes sense in the online environment – and save money besides, lots of it. And we’ll talk a little about why we need these savings along the way.

## scholarship: what's the point? (1 of 4)

I am a firm believer in strategic planning. If we want to get to where we want to go, the first step is figuring out where that is. If we start off with a clear picture our vision and goals, this gives us guidance to help us know if we are going in the right direction.

So what is the point to all of this scholarship? What are we scholars trying to do?

There are, literally, millions of scholars around the world, and at least as many research questions. We cannot explore them all in this short session! But let's think about just a few, because I think this really helps to put our conversation on scholarly communications in perspective.

One of the really big questions that many scholars (and others) are thinking about today, is what to do about global warming. Collectively, all of us on this planet have enormous challenges to face, and a tight deadline to meet. Some of the questions for scholars, and for all of us, involve sciences, politics, economics, behavior change, and addressing issues of global inequity.

Another big picture question is how to create economic systems that are healthy, productive, environmentally sustainable – and stable.

Some of the research to address these really big questions is small and local in scope. Biodiversity is a huge topic of global significance; but the research often involves things like looking at rare plants and animals that only live in a small geographic area.

These are some of the big questions that we all understand. But to paraphrase the Bard a little – there is more on heaven and earth than we humans have ever dreamed. And there are scholars, right now, exploring ideas and truths that we may not understand for centuries to come. Today, we appreciate the contributions of Mendel, who figured out the basics of how heredity works. But for about a century after this work was done, no one paid much attention.

## scholarship: what's the point? (2 of 4)

In recent years, we have heard a lot about the concept of the paradigm. Who here has heard of Thomas Kuhn and his *Structure of Scientific Revolutions*? What about Ludwik Fleck and the *Genesis and Development of a Scientific Fact*? Fleck's work was written in German, in 1932; this book inspired Thomas Kuhn so much that he worked hard to have the book translated in English and published in the 70's. If, like me, you are interested in philosophy of science, it is a good idea to read this book today, because Fleck's work contains many ideas that are not yet fully explored, that are very relevant to our times; thoughts about the essentially collaborative nature of science, and the impact of things like thought-styles and mood on the formation of scientific ideas. One of the most basic questions for us as academic librarians today, is how we can facilitate the transition of scholarly communication in the internet age in a way that best helps scholars to figure out the answers to these and other scholarly questions, whatever they may be.

While the very essence of academia – today, at least, this has not always been the case – is innovative in nature, in our everyday procedures we are very traditional, very conservative – and that is a good thing. There is much to be said for the ivory tower that stands a little bit apart from the rest of society, that does not bend with every whim of fashion or radically alter direction with every change of government. But there are times when it is in the interests of scholarship for scholars to rethink some of those traditions; and these are one of these times. Let's consider why this is so.

Last September, I began a PhD program at the SFU School of Communication. As an aside, it is a fascinating and fine experience to be a librarian / scholar at a university where the library's services are very much appreciated; not to mention basking in the reflected glory of our highly esteemed liaison librarian, Sylvia Roberts. Sometimes one of my teachers will actually say in class, "Of course Heather knows all about this. She's a librarian". And of course, it is true!

## scholarship: what's the point? (3 of 4)

As a PhD student, I am learning about concepts like hybridity. I am very much a hybrid creature, a librarian/scholar. I am also a student working in a hybrid world between the print world and online. When I first started, I gathered together some boxes for all the photocopies of articles that I expected to collect. These are beginning to fill – but not as much as I'd thought. Don't get me wrong, I still like reading print. Especially at the beach, on a fine summer's day in Vancouver! But students are beginning to talk about the advantages of keeping things online. It might be nice to read all those books and articles and other stuff for your thesis in print, but when you're ready to write, there is no "find" button that works with a stack of printed material. Increasingly, my reading is online, and not only articles, but also books. When a copy of my book arrived for proofreading, I was travelling and only had access to my iphone. So I proofread my book on the iphone. This is not ideal, but it is doable. Give me a multi-purpose device that is just a little bit bigger and easier to read – and sandproof – and for me, it'll be good-bye print, even for books.

When I read as a scholar, most of what I read is written by scholars like me. We write and publish because we have to, to get our PhDs and establish our careers. We aren't paid at all for writing or peer reviewing journal articles; if we receive royalties for books, these are generally very small compared to the effort involved.

When I read online, whether it's a book or an article, I want to copy the work to my desktop. I want to be able to highlight – in the colours of MY choice – and I want to be able to comment. I want to be able to share the work, with or without my markup. As a student, the copy that I really, really want to read is not the pristine publishers' version – it my professor's personal copy, with my professor's highlighting and comments. I want to keep the copy after I graduate, especially if I cite it in a paper that I've published. It makes sense to me that someday soon, when I submit a paper for publication, I should be submitting it as part of a folder, along with all the works cited. This would facilitate the work of editors and peer reviewers. I think there should be an automated "quote and citation check" similar to the spelling and grammar check. The would save time for authors, reviewers, and editors.

## scholarship: what's the point? (4 of 4)

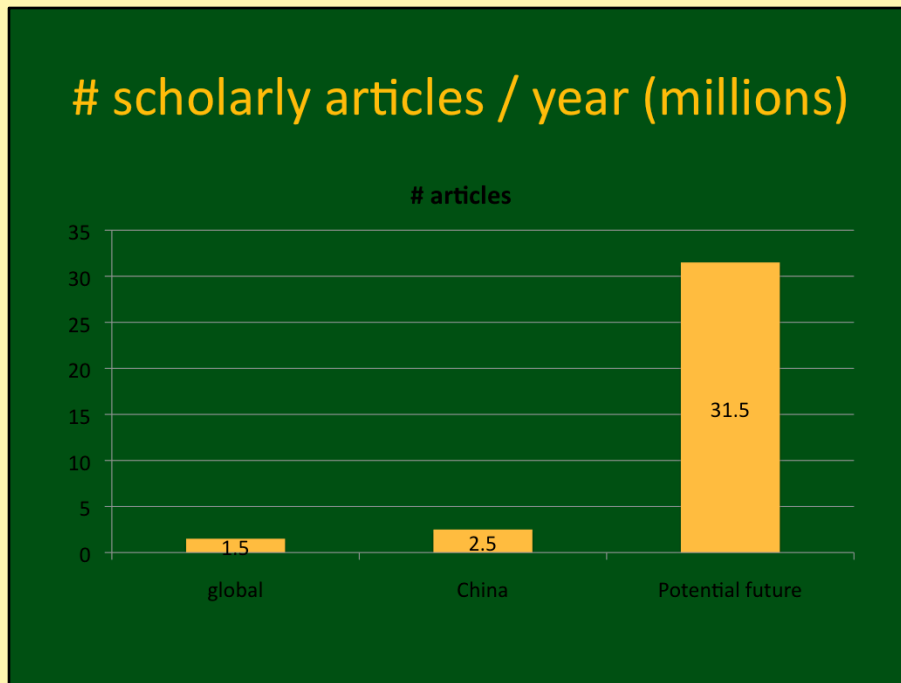
When a publisher adds digital rights management or DRM that stops me from downloading, highlighting, or commenting, this frustrates me and makes it harder for me to do my work as a scholar. Publishers like to talk about the value they add. DRM, for scholars, is NOT a value-add; it is a value-subtract. I do not wish this frustration as a reader; as an author, I do not wish the frustration of DRM for my readers.

To go back to our research questions, if I am working on an idea for economics that will help us move towards global equity, like open access, if my time is taken up with extra steps to work around DRM designed to protect publisher profits, this is not a help to meet the goals of scholarship; it is a hindrance.

A scholarly work without DRM is libre open access, the open access envisioned by the Budapest Open Access Initiative, free to read but also free to re-use. Right now, only a small percentage of open access work is libre OA. But the more experience scholars have with libre open access, the more that scholars will come to see that for scholarship, this just makes sense. And so I am predicting that demand for libre OA will soon begin to grow; as we scholars look for OA as readers, our tendency to seek libre OA as authors will grow as well.

The information explosion has long become a cliché, but the volume of information continues to rapidly expand, and there is no end in sight. It used to be the case that scholars were expected to do comprehensive research to obtain a PhD. Today, in many areas, this is no longer possible. I don't think we really know what the implications are of moving away from comprehensive research. This would a good research question for a librarian.

## # scholarly articles / year (millions)



Already, we all feel overwhelmed with the sheer volume of information that is available on almost any topic. Let's look at what happens as just one developing country, China, begins to produce a quantity of scholarship that is roughly equivalent to what we produce in the developed world today.

To the left of the slide, we have current global scholarly peer-reviewed article output, 1.5 million articles per year, based on Bjork's estimate. In the middle, we see the 2.5 million peer-reviewed journals articles per currently currently being produced in China alone, according to a recent article in SciDevNet. One of the key points in this article is that there is a serious bottleneck in China, with nowhere near enough journals to accommodate the 30 million scholars in China who need to publish for career reasons. If we assume that in the next few years China's journal production expands – this would be very easy to do with Open Journal Systems – it is entirely within the realm of possibility that we could see an expansion of article production to well over 30 million articles per year, assuming an average of 1 article per year per Chinese scholar. This is, potentially, a more than thirty-fold increase in journal article production in the world in a very short period of time. Then, too, China may be big, but it is only one country; the full picture needs to include every other developing country, too.

When we look at this picture as readers, it is pretty scary, isn't it? We can't keep up with 1.5 million articles per year, how on earth could we cope with over 30 million, and much of it in Chinese? But on the other hand, when we look at this from the perspective of one of our research questions, climate change, we have millions more scholars to join us on our quest for answers. So hooray and welcome to scholars from China and India and every other developing country.

Leaving aside the fact that we can now publish a great deal more than just journal articles – including theses, open datasets, grey literature, audiovisual material – and much more – let's look at some of the options for coping with all of these articles.

## read less?

When we look at how much information could be coming our way, much, much more than we have now, we might be tempted to resign ourselves to reading less of the total. For that matter, this scenario is so scary it might be tempting to want to know a little less. Maybe I should forget about all this scholarly stuff like trying to figure out the role of the library in the emerging global public sphere, and swing by my local public library and pick up a novel from the fast reads section on the way to the beach.

For those who are profiting on the existing system, this may be the obvious preferred solution: scholars should filter their reading by only reading the journals that they publish, or only reading the core journals, many of which they happen to publish. This may well suit the profits of the few, and simplify the lives of some scholars as they would have less reading to do – but does this help us to get to the answers of some of our big research questions?

It may be a little scary to think about reading all those millions of articles coming from China. But what if Chinese scholars come up with ideas that could lead to a breakthrough in clean energy? Do we really want our scholars to say, sorry I am not going to read this, I am overwhelmed?

This is not a moot point, nor is it exceptional. The research questions that we began with – some of the challenges for all of us around the planet – are global in nature and consequences. Our planet is one biosphere. There is no point to competition to find solutions. If planetary global warming stops soon, we all win. If it doesn't, we all lose. There is little point to working separately. If one region completely eliminates greenhouse gas emissions but Canada fails to take action, we all suffer the consequences. To meet this challenge, we need to cooperate on a global scale. Busy as we are, we scholars need to broaden the conversation, to make space for the contributions of more scholars.

## write less?

So if reading less is not such a good idea, what about writing less? This is an approach that I believe merits some exploration. Currently, many scholars feel pressure to produce writing in quantity in a way that is sometimes actually counter-productive for scholarship. A recently released report by Harley and others on the future of scholarly communication discusses the pressure on English scholars to write two books before tenure, where one used to be enough. What happens is that many scholars rework their thesis into a book, rather than beginning new research. This is counterproductive. This is where Ludwik Fleck's ideas on thought style can be helpful. I would characterize our current thought style as quantitative in nature. We tend to think that what is important is what can be counted, and we think more is better. It is common for a new faculty member to rewrite thesis chapters for publication as journal articles. In the print world, this made some sense, as theses were not broadly disseminated. Now that theses can be made readily available to everyone, everywhere with an internet connection, this wastes the time of the scholar who would otherwise be free to generate new knowledge.



## collaborate

Scholarship is increasingly collaborative in nature. Collaborating can be a way of coping with large quantities of complex material. Team members can divide up the work of in-depth reading and share summaries of key points that are most relevant to the research at hand. Collaboration can also potentially decrease the number of articles written on a per-author basis. The large-scale collaborations in high energy physics, famous for the thousand-author article, are one example. Collaborations can be within institutions, national or global in scope, and are often interdisciplinary. One way for a research team to cope with large quantities of research literature is to include an embedded librarian in the research team.

Some scholarly work is well-suited to wiki-like collaboration. In the area of open access, one of the open collaborations that I participate in is the *Open Access Directory*. Current tenure and promotion procedures reward scholars for ignoring these kinds of collaborations and focusing on the traditional peer-reviewed journal article instead. As a hybrid scholar/activist, this strikes me as backward. If a scholar is working in the area of open access, and the priorities are research questions like how can we transition to open access, then participating in OAD is not a sideline; it should be our top priority. Currently, scholarly career decisions are based on traditional publications, peer-reviewed journal articles and monographs. These are important, and will continue to be so for some time (perhaps forever) – but would it be a good idea to create some space for scholarly recognition of collaborative sharing? Let's go back to our big research questions. If a scholar is working toward resolving global warming, what do we want the scholar to focus on – traditional tenure and promotion procedures that were designed for a world where scholarship was best disseminated in print, or the research question itself and whatever approach seems best suited to get us the answers as quickly as possible? My answer is that we need our scholars to focus on the most effective scholarship. To resolve global warming as quickly as possible, the approach that looks to me to be the most promising is something along the lines of the open collaboration of the Human Genome Project. This will probably not be a perfect fit with traditional tenure and promotion procedures. If this is the case, we need to change the tenure and promotion procedures, so that scholars are free to prioritize scholarship over tradition, where these are in conflict.



It is not easy to change tenure and promotion procedures, nor is it the mandate of librarians to do so.

But I would argue that the good work we librarians have done in the area of scholarly communication has opened a window of opportunity, opening up the possibilities not only for change in scholarly communication, but for scholars to engage in these broader discussions as well.

Now let's talk about this window of opportunity, how it came about and what I see as some of the next steps for us as librarians.

It seems like a long time ago now that we librarians first identified the serials crisis, and a need for change in scholarly communications. We organized for change, in our libraries, through our library consortia, scholarly communication committees in our organizations, and even whole new organizations such as the Scholarly Publishing and Academic Resources Coalition, or SPARC. We have created campaigns to Create Change – and change is happening.

The Directory of Open Access Journals lists over 4,700 fully open access, peer-reviewed scholarly journals, and is growing by about 2 titles per day. This is more than 15% of the world's scholarly journals. 142 of these journals are published in Canada. As I am sure many of you know, many of those journals are published right here in Ontario, with hosting provided by academic libraries and government agencies.

There is a wide range in quality of open access journals, just as there is a wide range in quality of subscription journals. We already have 5 open access journals that are at the very top of their field in terms of impact factor. 4 of these are PLoS journals, while the other is the Journal of Medical Internet Research, published right here in Toronto by Gunther Eysenbach.

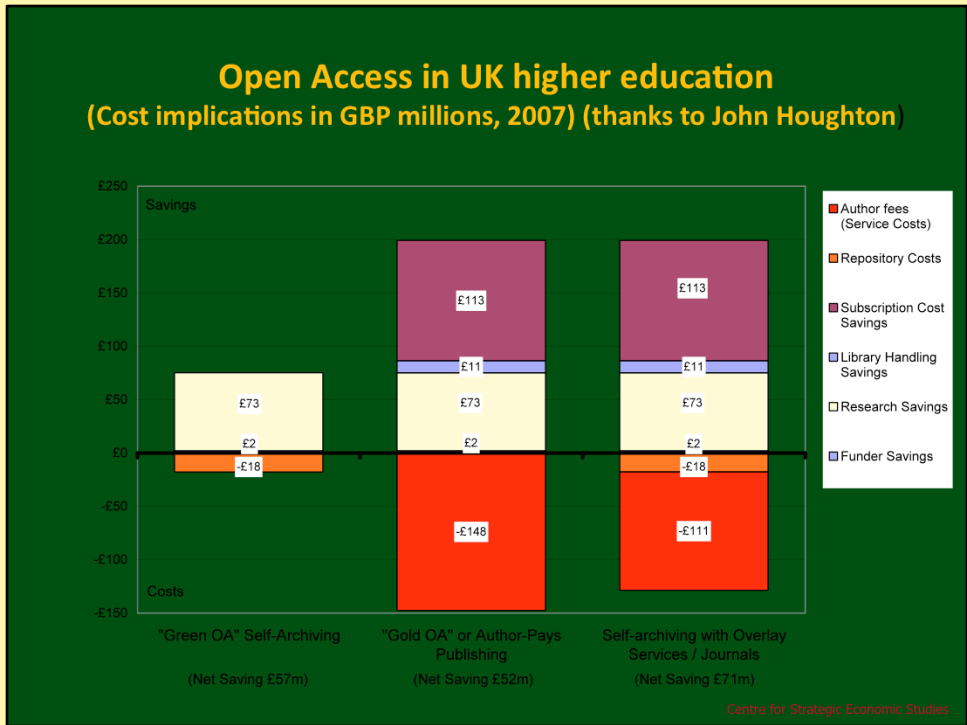


OpenDOAR, a vetted list of open access repositories, lists more than 1,500 repositories around the world, and Ontario is certainly well represented on this list. The number of publications freely access through the Bielefeld Academic Search Engine is over 22 million, and the numbers are growing by the millions every quarter.

There are well over a hundred open access mandates around the world, by funding agencies and universities. I was pleasantly surprised to read a recent issue of Peter Suber's SPARC Open Access Newsletter which said that Canada had the largest number of new open access funding agency mandates last year, 5 altogether. This may be less of a surprise here in Ontario, since many of these mandates were developed right here – not only the federal mandates such as the Canadian Institutes of Health Research' Policy on Access to Research Outputs and the mandates at the National Research Council, International Development Research Council, but also provincial funding agencies such as the Ontario Institutes of Cancer Research, and university mandates such as the one recently adopted by the University of Ottawa! We're a little more laid-back on the west coast; so far, we have only one mandate in BC that I know, at the Michael J. Smith Foundation, but no worries, we'll catch up. Maybe next winter – there are no major events planned yet, at least not that I know of.

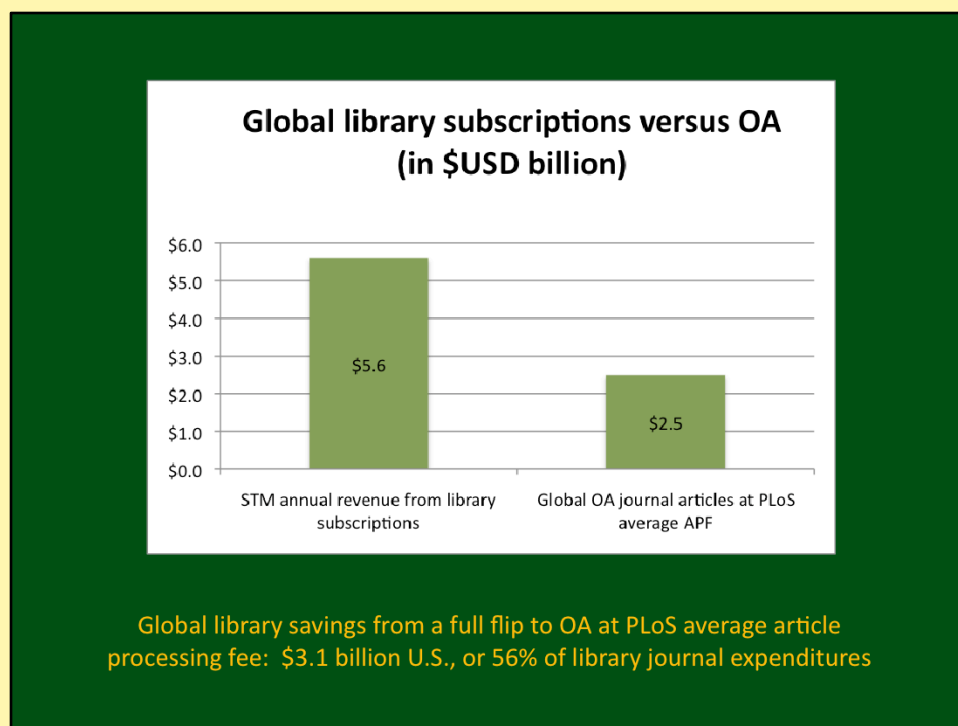
What is really amazing about this dramatic growth of open access, is that it has taken place with virtually no resources. As you know, almost all of our academic library funding is tied up with current subscriptions. In the next phase of transition to open access, a key step will be redirecting resources to support existing open access initiatives, and to fund new ones.

You may be wondering where the money will come from. We now have evidence that a fully open access scholarly publishing system can cost a fraction of what we are now paying for subscriptions. Let's have a look at some of this evidence.

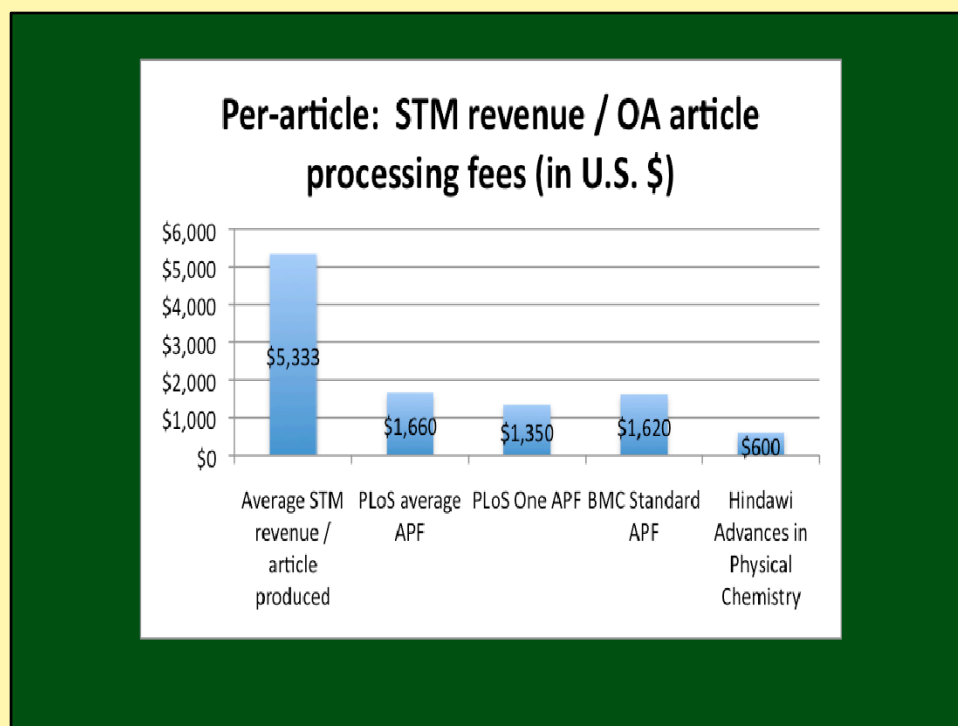


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John Houghton, an economist based in Australia, has worked with a research team to conduct major studies of the impact of a full shift to open access in several countries. These studies were in-depth, examining every phase of scholarly communication from reading to publishing to costs for subscriptions, library handling and repositories, and taking into account such factors as national inflow and outflow of capital for subscriptions. The results in every country studied so far – the U.K., Denmark, and the Netherlands – illustrate cost savings from a full switch to open access, even if the country moves unilaterally to open access for its own research output. This chart (thanks to John Houghton) shows the implications for higher education in the U.K. with a full shift to open access, using 3 models. The top part of the slide shows cost savings for each model, while the bottom part of the slide shows new costs. Simply making all work freely available through repositories, or “green” open access, with no other changes, results in net annual savings of 57 million pounds. With full “gold” open access publishing, the net annual savings are 52 million pounds. The third model, self-archiving with peer-review as an overlay, yields the greatest net savings, 71 million pounds per year. This third model is more transformative in nature; in the short-term, it is the green or the gold open access options that are more achievable. I would like to emphasize that these savings are based on a unilateral move to full open access by the country involved.



This slide shows my own, much simpler macro analysis illustrating the cost savings that would be possible with a global shift by academic libraries from subscription payments to open access via article processing fees. The global annual revenue for scholarly journals reported by The International Association of Scientific, Medical and Technical Publishers or STM, as reported by Mark Ware on behalf of STM last year, is \$8 billion U.S. Ware quotes a study by the Research Information Network that the percentage of this total that comes from academic library subscriptions is between 68 and 75%. Assuming a low mid-point of 70%, we get a total global annual expenditure by academic libraries of \$5.6 billion U.S. Ware quotes the Bjork study which reported a total global annual output of scholarly articles of 1.5 million. If libraries were to pay article processing fees for every one of those 1.5 million articles, at PLoS average rates, the total annual cost would be \$2.5 billion. The total annual global library savings from this shift would be \$3.1 billion, or 56% of current expenditures. Another way to say this, is that academic libraries could fund a fully open access scholarly journal article system, at PLoS rates, at less than half of what we pay now for journal subscriptions.



This chart shows a similar picture in a slightly different way. For every scholarly article produced in the world – not just by STM – STM revenue is over \$5,300 U.S. The PLoS average APF is \$1,660 U.S., less than a third of STM revenue per article. PLoS One is \$1,350 U.S.; the BioMedCentral standard APF is \$1,620 U.S. Other publishers or journals may charge considerably less; for example, Hindawi Advances in Physical Chemistry charges only \$600 per article, just over 10% of average STM revenue per article.

The point is that there is far more than enough money in the subscriptions budgets of academic libraries to fund a fully open access scholarly publishing system, with substantial savings to boot. Another point that I would like to make is that we need to make this transition, not only to achieve open access, but also because we need these savings.

## why we need the savings

In addition to all that we are doing now, there is important new work that libraries need to take on. As scholars move to collaborative online writing, through wikis, blogs, open sharing of data and audiovisual materials, we need to collect, support, and preserve this information. We have work to do to ensure that electronic books and journals are preserved and kept accessible locally. We have made a good start on digitizing primary historical materials, but it is only a start, there is lots more to do, and we need to find a way to preserve the information on a long-term basis.

## how? (1 of 2)

Okay, so hopefully you are convinced by now that the money is there, and savings besides; but right now, the money is still all tied up in subscriptions and big deals, sometimes on a long-term basis. How can we make the leap to an open access future? One way is to simply keep up all the great work that we're already doing. Building the open access repositories, working with the technology, working with faculty and university administration towards the open access mandates that will fill the repositories. Hosting open access journals. Helping faculty to retain author's rights, and to learn about the options that are now available to them, and to their scholarly societies. Conducting scholarly communication workshops and planning open access week celebrations.

As we license those subscriptions, we can simply shift the terms, to change our understanding of what it is that we are purchasing. Scholarly publishing is not like a commercial business; our faculty are both the readers and the authors. The University of California Library system pioneered the hybrid license / open choice arrangement with Springer. I expect that we will see more arrangements like this. This doesn't give us all the cost savings that I'd like to see, but it will make it easier to fill those open access repositories, and help the scholarly publishers to make the transition as well. It is a useful interim step while we are all caught in between the subscription big deals and the open access future.

Libraries are setting up open access author's funds, to provide support for OA via article processing fees. Some of these libraries have gathered together in a group called the Compact for Open Access Publishing Equity, or COPE. The initial dollar commitments are not necessarily huge. I highly recommend this approach, as even a small dollar commitment gives a library plenty of opportunity to overcome the learning curve involved; and someplace for our faculty who do wish to publish in OA journals using APFs to go.



## how? (2 of 2)

Here in Canada, I know that libraries and university presses are doing a lot to support open access publishing. It would be great to have a picture of what is happening, and what models to support OA publishing might receive broad support in future. A group of us, including Don Taylor and Brian Owen at SFU, Kumiko Vezina at Concordia, and Andrew Waller at U of C, are planning a pan-Canadian survey to answer these very questions. Watch for the survey in March.

There is more that we can do to prepare for the transition at our own libraries. The kind of help that scholars need from librarians is changing. There is less need for traditional basic reference help, and more for in-depth research assistance and embedded librarianship. We librarians need to learn more about how to do research, and more about new forms of scholarship such as open data, and how to work with these new forms. The continuing increase in the amount and types of information available will only increase the need for information literacy skills. There will be more need for translation services; some of this can be automated, but not all. At many a Canadian university, this could be a good job opportunity for students or grads with both linguistic and academic skills; it might make sense for the library to act as an intermediary to meet these needs.

Systems staff can prepare for a future where supporting journal hosting and institutional repositories services, data hosting and preservation may be the priorities, and less time is taken up with troubleshooting the authentication systems designed to prevent reading. The roles of paraprofessionals and support staff have the potential to morph into the transition to the online age, too. For example, document delivery staff have skills that can easily transfer to the open access repository.

## the future is open

We have a lot of work ahead of us in the next few years. We have exciting challenges to look forward to. We have opened a window to help in the transformation of scholarly communication for the internet age, a future that will be largely open access – libre open access, and one in which scholars increasingly work, write and share in different ways, more openly and collaboratively than has been the case in the past. The pace of change in this area is fast. Sometimes, it might be tempting to want to slow down, to wait until we have it all figured out before we make any changes. But looking at the big research questions that we have to address, questions like how to resolve global warming, there are real deadlines. Now is not the time to slow down. When we have completed the transition to open access, we will have the resources that we need to do what needs to be done, including the preservation work that we all know needs to be addressed. Then, we will still have more than enough work to do, but we will be able to slow down a little. As we begin to become embedded librarians, partners in the research team, we come full circle, back to the research questions, and we become a part of the quest for answers to the questions that we know about, and the ones we don't know we don't know yet. This is as good a time as any to complete the formal part of this session, and begin the next steps of this journey.

## Questions?

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The Imaginary Journal of Poetic  
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