Richard Poynder on the state of open access: Where are we? What still needs to be done?

This is the final in a series of Q&As looking at the current state of open access. The questions below were posed by neurobiologist and open access advocate Björn Brembs and answered by independent journalist and blogger Richard Poynder. Richard has been following the open access movement for over a decade. The full list of those taking part in this Q&A series can be found here.

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The Q&A begins

> ***Q: What was your background going into OA reporting? When and why did you become interested in OA? What specifically prompted you to start interviewing OA protagonists?***

A: My background? I left school at 15 to join the Royal Navy as a rating. On leaving the Navy I became a railway guard. This allowed me to sit in the back of trains reading Shakespeare and books on sociology in order to obtain my A levels to go to university as a mature student (to get a humanities degree). Thereafter, I spent some time as a schoolteacher before turning to freelance journalism.

In 1988, I took a job with British Telecom, as editor of an online business journal run by Micronet, then the largest information provider on BT's proprietary viewdata service Prestel.

I returned to freelance writing in 1992 after Micronet was closed, and began writing for the technology page of the *Financial Times* and doing occasional features for the *Wall Street Journal Europe* and several UK newspapers. I also wrote regularly for *The Big Issue*, the magazine sold on the streets by homeless people.

At that time I also became editor of *Information World Review (IWR)*. *IWR* reported on the "online information industry", which then consisted primarily of expensive dialup services like Dialog, DataStar, LexisNexis, and STN International. These services sold access to a mix of business, legal, chemical, patent and trademark information. Initially, this consisted primarily of abstracts, citations and bibliographic data, later full text and images were added.

In reporting for *IWR* I became particularly interested in patents and patent information. At that time the controversy was beginning to heat up as to whether genes should be patentable, as was the question of whether patents should be granted on software and so-called "business method" patents. (In 2000 I was asked to produce a report/advisory document on software patents for the UK Department of Trade & Industry).

I was also intrigued by the fact that although patent offices are required to make patent documents freely available to the public, professional information providers were nevertheless making a good living out of selling the information contained in patents in online value-added databases.

In exploring the issues around software patents I bumped into the open source software movement, and thence to the other free and open movements at that time gaining traction, including open access. I could see that a fascinating struggle was getting under way between supporters of traditional proprietary ways of doing things, and those who wanted to see more open methods adopted. In order to explore this in more depth I began a series of interviews with protagonists from the various free and open movements. These were later published as *The Basement Interviews*.

After doing the interviews I concluded that open access was being underreported relative to, say, free and open source software, and so decided to focus on OA. But I always saw OA as just one component of a larger revolution. That is still my view, although I am not optimistic about the outcomes of the various open movements.

> ***Q: Is there something that you've always wondered, but never asked your interviewees? If so what and why not?***

A: To answer this question it might help to provide some further background. Initially I planned to publish *The Basement Interviews* with O'Reilly, and I signed a book contract with the publisher to that end. (O'Reilly subsequently ripped the contract up when its book business ran into difficulties, so I published the interviews myself on the Web).

I chose the Q&A format I mainly use when doing interviews because O'Reilly pointed me to a series of Q&As with writers like E M Forster and Ernest Hemmingway that *The Paris Review* had undertaken in the 1950s, and suggested I use a similar format. I liked the idea as I felt it would allow me to better probe the motives and personalities of the people I planned to interview, which I was keen to do. (Another model I had in mind was that used in the Face to Face interviews undertaken by John Freeman for the BBC, also in the 1950s).

At first this approach seemed to work well (a good example, I feel, is the interview I did with free software guru Richard Stallman). However, it later became apparent that interviewees were not entirely comfortable with it, so today I tend not to probe so much. Even so, I evidently still ask questions that some interviewees do not welcome. I have even had people threaten to sue me simply for asking questions!

I should add that another characteristic of both the interviews I do and the articles I write is that they tend to be long (overlong some tell me). This, coupled with the fact that my interviewees are sometimes put off by the nature of my questions, means that a good number of the Q&As I start, or plan to do, are never completed — either because the interviewee runs out of energy or patience during the interview process (which I usually do by email, but often iteratively in order to make it more like a conversation), or because they baulk when they see the questions.

So yes, there are always things I wonder about but do not ask. And when I do not ask them it is often because I have learned that if your questions are too searching, or probe too much into controversial issues, you may find that you have to abandon the interview, which is a waste of everyone's time.

It can be frustrating, but I am conscious that I too might jib at answering some of my own questions were someone to put them to me!

> ***Q: Having covered OA as an outside observer for such a long time period, do you find it difficult to remain impartial?***

A: Yes, it is difficult. With any industry where incumbents feel under siege because highly-motivated critics are demanding that they change the way they do things, both sides in the debate can too easily slip into binary thinking, and assume that there are only good guys and bad guys, and that anyone who does not agree with them must be a bad guy.

Thus on the OA side, advocates tend to assume that anyone or anything that makes claims about being committed to openness is good, and anyone that questions any aspect of openness, or highlights the benefits of proprietary ways of doing things, is bad.

For their part, publishers tend to assume that OA advocates are freeloaders or — as ACS's Rudy Baum appeared to imply in 2004 — dangerous socialists. Interestingly, however, as they have gradually come to accept Gold OA publishers have adapted their views somewhat, and now tend to assume that the real collectivists are those who advocate for Green OA.

What this means for me is that trying to navigate a straight path through the OA waters can be challenging. So, for instance, in my efforts to observe and report on OA I come under pressure from both sides to agree with them, and to reject their opponents' views. Sometimes I am even asked not to write about certain things, or to write about them in a directed way.

It also means that my attempts to be an independent observer (or "chronicler" as Stevan Harnad has put it) often lead OA advocates to brand me as "anti-OA" and publishers to accuse me of being "anti-publisher".

I experience similar pressure in my capacity as moderator of the Global Open Access Mailing List (GOAL), a role that requires me to try to be impartial. Here too I am sometimes charged with bias — although it is usually an accusation that I have favoured one faction of the OA movement over another.

It is important to add, however, that there are those on both sides of the divide who respect and even welcome objective reporting. Harvard's Peter Suber, for instance, has always encouraged a balanced approach. I believe the same can be said of Stephen Curry.

On the other side of the barrier (as it were) I have the impression that Kent Anderson respects independent reporting. Of course unlike Suber or Curry, Anderson is a somewhat controversial figure, and he takes a combative approach when writing about OA himself. But I have formed the impression that he understands and appreciates objective journalism when undertaken by others. In my view Joe Esposito (interviewed earlier in this Q&A series) also respects independent reporting.

Of Anderson I would add that while he is tendentious, and has a very defined attitude towards OA, he asks important questions about the OA movement (e.g. here, here, and here), questions that ought to be asked but too rarely are.

When people tell me I am biased I reply that while I support the principle of OA, I do not consider myself to be an OA advocate. Interestingly, I think that most publishers would say much the same thing if asked to express a view on OA today.

So yes, it can be difficult to remain impartial, not least because binary thinking is infectious and it is easy to get sucked in when talking to people who have very strong views on a topic, and present only one side of the picture. This means that I am not always as impartial as I would like to be. (But we are all human!)

I am also conscious that in taking part in this Q&A and giving my opinions my impartiality is likely to come under further scrutiny.

> ***Q: What would you say have been the biggest achievements of the OA movement during the time you have been following it, and what have been the biggest failures?***

A: The case for OA has been made so thoroughly now that only those who have a vested interest in the current system, or are confused about the issues, deny its logic or its inevitability. That I think is the biggest achievement of the movement — a success most recently demonstrated by Section 527 of the Omnibus Appropriations Bill, passed by US Congress in January. As you know, this requires federal agencies under the Departments of Labor, Health and Human Services, and Education with research budgets of $100 million or more to provide the public with online access to articles resulting from research they have funded (within 12 months of publication).

The OA movement's success undoubtedly owes much to organisations like SPARC, and to events like the Budapest Open Access Initiative (BOAI). In addition, of course, all those who have advocated for OA have played their own small part in helping OA gain mindshare, particularly those individuals who have worked hard to persuade their colleagues, and research institutions and funders around the world, to introduce OA policies. One name that comes to mind is that of Harvard's Stuart Shieber, who worked tirelessly to persuade his colleagues to vote for the ground-breaking Harvard

OA policy, first introduced by Harvard's Faculty of Arts and Sciences in 2008.

SPARC is also an active political lobbyist and helped defeat the Research Works Act. Likewise, it was instrumental in the introduction into US Congress of OA bills like FRPAA and FASTR. SPARC's Executive Director Heather Joseph (interviewed earlier in this Q&A series) also helped launch the successful petition to the White House that led to the Memorandum on public access that the US Office of Science and Technology Policy (OSTP) issued last year. As you will also know, this directed US federal agencies to develop plans to make the published results of federally funded research freely available to the public within one year of publication. The OSTP Memorandum is similar to the Omnibus Bill but applies to more agencies.

These and other successes have been well rehearsed already in this Q&A series, so I will leave it at that. (Although I might later want to qualify what I have said above). Let me instead play devil's advocate, by focusing on what I believe to have been the movement's failures — or what I would prefer to call its weaknesses.

OA advocates argue (correctly in my view) that the moment the Internet was created OA to scholarly research became inevitable. If that is right, then it has always only ever been a question of time before OA becomes the norm for scholarly communication. As such, the primary objective of the movement should have been to develop and pursue a coherent and practical action plan to ensure the inevitable transition to OA occurs as rapidly as possible.

I cannot help note, however, that it is now 25 years since the web was invented, 23 years since the creation of the physics preprint server arXiv, twenty years since Stevan Harnad posted his *Subversive Proposal*, fourteen years since the first OA publisher (BioMed Central) was founded, and 12 years since the BOAI meeting in Budapest. Yet OA is only just now entering the mainstream and a huge amount of work remains to be done. Apart from anything else, many, many researchers have yet to be persuaded to embrace OA, and a good many remain implacably opposed to it, particularly humanities and social science scholars — as demonstrated in the Q&A in this series with Robin Osborne.

I believe there are also grounds for arguing that, due to the weaknesses I see in the way the movement has developed, OA is in danger of being appropriated by publishers, a development unlikely to lead to outcomes that will please many OA advocates.

So I feel bound to ask: if OA is inevitable why has far more not been achieved in the past quarter century, why has the debate become so confused, and why are publishers apparently being allowed to subvert the process of migrating to OA?

Clearly, one could argue that the social change OA requires takes time, particularly given that publishers were initially highly resistant to changing the way they do things.

But I wonder if the movement has not been its own worst enemy. After all, it is far from unified, and it has spent a great deal of valuable time arguing with itself rather than winning hearts and minds, or taking the practical action needed to achieve its objectives. It is also noteworthy that OA advocates continue to argue amongst themselves today, not just about how to achieve OA, but even over what OA is!

On that last point: as you know, there are three major definitions of OA — the BOAI, the Bethesda Statement and the Berlin Declaration. (There are also a multitude of other declarations and statements, listed by Charles Bailey here). One immediate problem with the three main definitions is that they are not entirely synonymous. For this reason, in 2004 Suber sought to combine them into what he called the BBB definition. However, this did not stop OA advocates from continuing to argue over the "true" definition of OA. Matters were further complicated when, in 2008, Suber and Harnad decided that the BBB definition was still incomplete. Suber therefore suggested two further definitions — so-called gratis and libre OA.

As Suber explained when publishing the new definitions, "[W]e still don't have widely accepted terms for the two sorts of free online access: (1) the kind which removes price barriers alone and (2) the kind which removes price barriers and at least some permission barriers. This gap in our vocabulary has caused confusion and conflicts, not least because it created pressure to use the term ‘open access’ for each.”

Unfortunately, Suber’s attempt to clarify matters was viewed by some OA advocates as a retrograde step, since they reject the notion that gratis OA is open access at all — on the grounds that it does not provide re-use rights. Others complained that even libre OA is inadequate, since it calls only for the removal of “some” permission barriers.

It is important to note that in proposing the gratis/libre distinction Suber acknowledged that the challenge he faced was not just that of arriving at a satisfactory definition of OA but of having the authority to make it official. As he conceded, “I’m in no position to legislate. If I were, usage would never have become ambiguous!”

Unsurprisingly, therefore, the wrangling has continued, as has the ambiguity. Writing on *The Scholarly Kitchen* blog last year OSTI consultant David Wojick described the open access debate as “a sea of confusion”.

He added, “These confusions take many forms but the deepest by far is the large number of contradictory models that fall under the term ‘open access’.”

University of Utah’s Rick Anderson agreed. “The confusion lies in the fact that when two people are conversing and using the phrase ‘open access,’ neither one can safely assume that the other is talking about the same thing.”

I think this abiding confusion, and the constant infighting, has been very damaging to the OA cause. Indeed, I would say that the OA movement has itself frequently held back rather than advanced the transition to OA.

But given the contentious nature of the topic, and the warring vested interests, could things have been any different? I think so. If, for instance, an OA foundation — or formal global organisation committed to clarity, practical action, inclusiveness and participation — had been created at the outset I believe OA advocates would have been better able to work together effectively. (This is something I suggested back in 2006).

So the biggest weakness I would point to is the failure of the movement to create such an organisation. Had it done so I believe it would have been able to speak with one voice. This in turn would have better allowed it to set the scope and terms of the debate and it might have frustrated publishers’ attempts to appropriate OA for its own ends.

When I raise this issue with key figures in the OA movement they respond that it would have been pointless to create such an organisation precisely because of the factionalism surrounding OA. Advocates, they say, would simply never have agreed on most things.

But this seems wrong to me. If an organisation had been created, a participative structure put in place, and a leader and executive committee elected, the movement could have united behind a definition and a common strategy years ago. Importantly, there would have been the authority of an official body behind this strategy.

If anyone at any time had decided that the policy or the priorities of the movement needed to be changed, updated or adjusted they could have used the structure of that organisation to seek to persuade others of the need for the change. Alternatively, they could have sought election on a platform that articulated the changes they deemed necessary. To argue that it would have been impossible and / or pointless to create a global participative OA organisation due to the range of competing opinions within the movement seems to me not unlike arguing that attempting to create a national government is impossible and /or pointless?

As it is, the OA movement can sometimes appear to be little more than a disparate collection of warring individuals and interest groups, most of whom, critics sometimes argue, represent no one but themselves, or the organisations that fund their activities or employ them (e.g. the Open Society Foundations, the Association of Research Libraries, the Open Access Scholarly Publishers

Association (OASPA), and the growing number of individual OA publishers).

Another response I get when I raise this issue is that the OA movement has sought to do no more than any pressure group seeks to do — influence governments and other decision makers to make changes that they believe are desirable. Even if one agrees with that, I would want to ask: would not the creation of a formal organisation have avoided a lot of the infighting, or at least channelled dissident energy in a more positive direction — by, for instance, allowing the disaffected to feel part of the process, rather than outsiders with their noses pressed to the window? And do not most pressure groups tend to have a formal structure and do more to encourage participation in decision making?

A further reason OA advocates sometimes give for not having created an official OA organisation is that in an age of web-based bottom-up organising there is no need for bureaucratic structures, which only slow things down and retard progress. What this ignores is that the research community itself is riddled with bureaucracy and researchers are shy to challenge the system lest doing so might damage their careers. Interestingly, when this truth became apparent to OA advocates they concluded that rather than spend all their time trying to persuade researchers to embrace OA they should focus on convincing governments, funding agencies and institutions to force researchers to do so (by means, for instance, of OA mandates). This suggests to me that any claim that the OA movement is a bottom-up revolution is a hollow one.

Be that as it may, when I speak to OA advocates who are unhappy with the way the movement has developed, and how decisions are made, I sense a mixture of anger, alienation and frustrated powerlessness. I do not know how representative these dissidents are, but some of them clearly feel that the entire research community (along with scholarly publishers) has been driven down a road chosen not by them (or by the research community at large) but by a small number of unaccountable interest groups. They also feel that decisions about OA are often taken behind closed doors, or in the lobby hall. For these dissidents any claim that OA is a bottom-up revolution also seems hollow.

I realise some might argue that the concept of a movement does not imply an organised group, and even that that the two terms are oxymoronic. But there is no shortage of groups today that claim to be part of the OA movement.

Of course, there will always be dissenters in any movement and no doubt OA was destined to experience conflict and factionalism no matter what. But in not organising itself more effectively the movement appears to have paid a price in other ways — e.g. through unnecessary duplication and wasted effort.

A more centralised approach could I think have avoided or mitigated some of this duplication — e.g. the creation of two competing repository registers (the Registry of Open Access Repositories [ROAR] and the Directory of Open Access Repositories [*Open*DOAR]), and several competing registers of OA mandates (The Registry of Open Access Repositories Mandatory Archiving Policies [ROARMAP], SHERPA/JULIET and MELIBEA).

Effort continues to be wasted. For instance, the Open Knowledge Foundation (which appears to have attracted to itself a bunch of Young Turks often at odds with first-generation OA advocates) has been trying to put together yet another register of mandates. It is also trying to draw up a list of OA experts — despite the fact that one already exists and is publicly available in the Open Access Directory (OAD).

A further consequence of this scattergun approach is that many OA projects end up on life-support (or dead in the water) once funding and/or energy dries up. This appears to have been the fate of both ROAR and its sister service ROARMAP, a problem highlighted recently by Rick Anderson, who pointed out that the latter has fallen into a state of “pervasive errors and misrepresentations”.

OA mandates (or policies as some prefer) are a further source of confusion. With no formal OA organisation to direct events, funders and research institutions have over the years introduced a ragbag of different policies, many of which are contradictory and/or clearly inadequate.

In 2009 Stuart Shieber (with Suber's assistance) tried to resolve this by publishing a model OA policy based on the Harvard one. Like Suber, however, Shieber is in no position to legislate. So while other universities sometimes use the Harvard model as a starting point, they frequently water it down in the process. Many of the resulting mandates are toothless and therefore of little practical benefit. While they may provide a "feel good" glow for the universities concerned, and for OA advocates, they have no real impact (As Rick Anderson puts it, many of them are "not real" mandates). Indeed, some argue that the Harvard mandate is itself too weak. Harnad, for instance, has argued this, and prefers what he calls the Immediate-Deposit/Optional Access (ID-OA) mandate.

SPARC has also developed a number of OA guides, further serving to confuse the situation over OA policies. Meanwhile, across the Atlantic a distinctive European model has emerged— the so-called Liège OA mandate.

Some OA advocates *are* sensitive to the problems caused by its decentralised approach. But they are addressing this, they say, by greater co-operation amongst the different organisations that support OA — through a process of federation. I can see that this could increase the effectiveness of the movement a little, but it will presumably still leave a lot of energetic people committed to OA and the reform of scholarly communication with their noses pressed to the window, along with those organisations not included in the federation. (I am, by the way, not aware of any published list of these federated organisations).

The second weakness I see in the movement is its failure to take the problem of "predatory publishing" seriously, or to seek to prevent or deter predatory publishers. This may be out of reluctance to draw attention to a problem inherent to pay-to-publish Gold OA. But by turning a blind eye to the issue for so long OA advocates have allowed what might have been a relatively minor problem become a serious one, one that is discrediting the OA movement and causing significant distress to those researchers unfortunate enough to be duped by a predator.

Instead, the policing of Gold OA has been left to lone librarian Jeffrey Beall. Not only was it unfair to leave such an onerous task to an isolated individual (who, amongst other things, has been threatened with litigation and subjected to what I take to be death threats), but the movement was recently mortified to discover that Beall appears to be motivated by a strong dislike of OA, and a political perspective that will surely be antithetical to every OA advocate on the planet.

It is only in the wake of what one might call Beall's "coming out" and the *Science* "sting" of OA journals that OA advocates have finally begun to take the matter seriously. Even so, far too little is still being done about the problem. The research community has therefore little choice but to continue relying on Beall's list for guidance about OA journals. While Beall is undoubtedly playing a valuable role, he cannot be considered an independent or objective adjudicator. Moreover, he seems interested not only in discrediting predatory publishers, but open access *per se*. This is unfortunate.

Again, would this nettle not have been seized far more quickly and more thoroughly if there had been a formal OA organisation? As it is, the movement has conspired in what one might call a prolonged period of collective irresponsibility, allowing the problem to grow to the point where scholarly communication at large could lose credibility.

Finally, I believe the movement made a mistake in allying itself with OA publishers. What it failed to appreciate is that publishers' interests are not the same as the interests of the research community. One need simply scan the OASPA membership list (which amongst other things now includes subscription publishers that OA advocates frequently berate for their proprietary business practices and "excessive" profits) to see that OA publishers share more in common with other publishers than they do with researchers or librarians.

Taken together, I believe these three weaknesses have had a significant impact on the effectiveness of the movement: The cacophony of conflicting voices, the constant warring, the absence of a formal organisation, and the decision to ally with OA publishers has all served to confuse researchers, research funders, and governments as to what needs to be done, how it should be done, and who should do it. For this reason, governments often turn for direction and advice not to OA advocates but to publishers (unlike OA advocates publishers invariably sing from the same hymn sheet on OA). This has helped publishers to exploit the situation to their own advantage, and led to poor policy decisions.

It saw, for instance, a clutch of publishers (both OA and subscription) invited to sit on the UK Finch Committee, where they were able to shepherd through a set of OA recommendations crafted to meet their needs more than the needs of the research community. These recommendations led to the pay-to-publish Gold OA policy introduced last year by Research Councils UK (RCUK).

As evidence of the confusion within the movement, OA advocates initially greeted the RCUK policy with great enthusiasm, believing it was a big win for them. After a short-lived period of euphoria, however, they could only conclude that the policy had been engineered primarily to protect publishers' revenues. OA was to be supported, but at a very high price to the research community. Unfortunately, their *volte face* seemed to confirm the growing suspicion amongst governments that OA advocates aspirations and expectations are confused and contradictory.

One can see the problem governments and funders face: once they put their minds to the matter they quickly grasp the logic and necessity of OA. Not wishing to be interventionist, however, they wait for the research community to come up with a viable strategy for migrating to OA.

Due to the sea of conflicting views and demands, and the sometimes bitter disputes, this does not happen. So governments eventually feel compelled to step in (as did UK Minister for Universities and Science David Willetts when he commissioned the Finch Report). And they tend to turn to publishers to guide them through the morass.

This dilemma was well articulated by the Dutch State Secretary for Education, Culture and Science Sander Dekker when speaking to the APE 2014 conference earlier this year. "Open access is a moral obligation, essential for society and inescapable," he told delegates. "No doubt you are thinking: 'That's nothing new.' 'We knew that long ago'. Over ten years ago, you [the research community] came together as a scientific community to establish just that in the Berlin declaration."

So why then, Dekker asked, are we not much farther down the road to OA? "The world has definitely not stood still in the last ten years. How can it be that the scientific world — which has always been a frontrunner in innovation — has made so little progress on this? Why are most scientific journals still hidden away behind paywalls?"

A few weeks earlier Dekker had described the problem in this way: "The stakeholders — researchers, universities and publishers — have, for one reason or another, been unable to arrive at a single system for making access to publications arising from publicly and publicly-privately funded research free for everyone at the point of use."

As a result, he added "A wide variety of rules, agreements and options for open access publishing have emerged in the research community. The situation is confusing for authors, readers and publishers alike, and the stakeholders would like this confusion to be resolved as quickly as possible."

Like Willetts before him, therefore, Dekker has concluded that governments have no choice but to intervene. Also like Willetts, he is of the view that the "single system" required is pay-to-publish Gold OA. Why wouldn't he?, cynics might respond, the Dutch economy does very well from scholarly publishing since many publishers are based in Holland (as is the case in the UK). However, that doesn't change the reality of the situation the OA movement faces.

What is that reality? The OA movement has sought to change a highly-bureaucratic system from the bottom up and in a decentralised way. In doing so it has failed to come up with a unified view, or an official organisation able to articulate and pursue an effective strategy. As a result, it is getting OA policies it does not like. True, a clearer set of recommendations emerged from the BOAI10 meeting two years ago, and since then projects have been initiated to try to align OA strategies within regional areas. But with governments now stepping in (and turning to publishers for guidance) critics might, with some justification, argue that this will likely prove too little too late.

Moreover, like the first BOAI meeting ten years earlier, delegates at BOAI10 were presumably selected by the organisation that funded the meeting — George Soros' Open Society Foundations. As such, the views, conclusions, and recommendations that emerged from the meeting cannot fairly be said to represent the views of the OA movement at large, and certainly not of the wider research community.

I say all this simply in answer to your question, not out of a desire to be critical for the sake of it, to point fingers or apportion blame. One could reasonably argue that what may be apparent in hindsight would have been less obvious ten years ago. And I have no doubt that all those involved in the OA movement are high-minded, well-intentioned individuals who genuinely want to improve the world.

I also accept I could be wrong and that the OA movement would have travelled the confused road it has even if it had organised itself differently. But if that is correct, and if OA is inevitable in any case, one might want to suggest that OA advocates might just as well have sat on their hands and waited for the inevitable to arrive.

Anyway, for what it is worth, those have been the three biggest weaknesses of the OA movement in my view.

> ***Q: There has always been a great deal of discussion (and disagreement) about Green, Gold and Hybrid OA. After the many different opinions expressed in your interviews, which roles do you see for these different approaches?***

A: Leaving aside the thorny issue of double dipping, like some of those interviewed in this Q&A series I see no useful purpose for Hybrid OA, other than as a way of allowing publishers to migrate their current revenues to an OA environment and to maintain control of scholarly communication in the process. In my view, this is neither a necessary nor a desirable outcome.

I have to say I am also deeply sceptical about pay-to-publish Gold OA. Remember that many joined the OA movement because they believed it would resolve the so-called serials crisis (that has seen scholarly journals increase in price at an unwarranted and unsustainable rate for several decades now). For me, therefore, a key question is this: Will OA publishing be any less expensive or any less prone to price inflation than subscription publishing? I am not convinced it will. When OA publisher BioMed Central launched it charged an APC of just $525 per paper. Today BMC charges from $1,755 to $2,321 per paper — an increase of 235% to 342% (and journals like *BMC Biology* and *Genome Biology* now charge even more). OA advocate Heather Morrison has commented on BMC's pricing recently here. In addition, there are rumours that BMC plans to increase its prices again later this year — at a time when some are complaining that the quality of the publishing service it provides is deteriorating.

PLOS' prices have risen less dramatically, but as APCs continue to go up, and as we see an increase in take up of Hybrid OA (where APC prices tend to start at $3,000 per paper and can be as high as $8,000 or, in the case of Elsevier, as high as $9,500), I have little doubt that PLOS will follow suit at some point. I am also conscious that even publishing consultant Joe Esposito appears to have concluded that PLOS' charges are already unwarrantedly high, and that the publisher's lifestyle is more "sumptuous" than one might expect of a non-profit organisation.

So I see no reason to believe that APC prices won't rise at the same unsustainable rate as subscriptions going forward, especially if APCs are paid by means of block grants, and new types of "Big Deal" arrangements are introduced by subscription publishers whereby APC fees are combined with subscriptions, and the price institutions pay is subject to non-disclosure agreements that prevent price transparency.

I realise that, theoretically, some other form of Gold OA could come to dominate, and pay-to-publish OA fade away. In fact, Peter Suber estimates that today nearly 70% of journals listed in the Directory of Open Access Journals (DOAJ) do not charge an APC. But I suspect this is partly a regional issue (i.e. likely to be more common in the Global South). Moreover, as the big subscription publishers migrate to OA, and as OA policies like those adopted by the Wellcome Trust, the European Union and RCUK encourage them to do so by means of Hybrid OA, it is hard not to conclude that pay-to-publish Gold OA is going to grow rapidly in the next few years, and is likely to become the norm in the developed world — unless funders and governments rethink their current OA strategies.

In my view a better strategy would be to prioritise Green OA. This would certainly seem to be the most cost-effective way of providing OA (as the 2012 Houghton and Swan study concluded), and so holds out the promise of making much better use of the research community's limited budget, and thus of taxpayer's money (Since it is the taxpayer who effectively funds scholarly communication).

I realise critics argue that Green OA only bolsters (rather than replaces) the subscription system, and so simply perpetuates a broken model. And I realise critics argue that only Gold OA can provide libre open access (which in fact is not correct: Green OA can be, and increasingly is, libre, and Gold OA is not always libre). However, I think the question to ask is this: is it better to provide immediate eyeball access to the world's research papers at no additional cost, or to pay publishers more money (in addition to the subscriptions that still need to be paid during the transition) in order to have *some* papers published with reuse rights (I say "some" because I cannot see how the research community can afford to pay to publish all its papers until it is able to cancel subscriptions, and I certainly don't think it will be able to do so at publishers' current asking price).

But the main reason why I prefer Green OA is that, in my view, rather than bolstering a broken system, it is more likely than Gold to foster the innovation required to create a 21st Century scholarly communication system. I also think it is more likely to make scholarly communication affordable over the long term, by the way, not just during the process of transition. I can perhaps elaborate on this later.

> ***Q: You have interviewed scholars, librarians and publishers. Do you think that OA inevitably leads to conflict and disagreement between publishers and the research community (including libraries)? Are publishers parasitizing the public purse by protecting an antiquated business model or is the research community and its passivity and inaction to blame for their current predicaments? Or is everything just fine and evolving at the right pace towards an adequate, sustainable scholarly communication system?***

A: To answer the last part of your question first: I think it will be apparent from my earlier answers that I do not believe everything is just fine. And yes, I do believe OA leads to conflict and disagreement. Given its disruptive nature, however, this is hardly surprising.

OA has certainly led to conflict between publishers and librarians, although it is important to point out that this conflict predates the OA movement. Librarians first fell out with publishers over the serials crisis several decades ago and many have remained in conflict with them ever since. Former Yale librarian Ann Okerson — interviewed earlier in this Q&A series — produced a seminal report outlining the problems of journal price inflation way back in 1989. So for libraries OA has only changed the tenor of a pre-existing conflict.

The most significant conflict today, however, is that between subscription publishers and OA advocates (many of whom of course are librarians). OA advocates are angry not only at the way in which these publishers initially resisted OA, but over the way in which they are now trying to appropriate it, and bend it to their own needs (e.g. by seeking to turn Gold OA into an overpriced pay-to-publish form of scholarly communication that offers publishers a great deal and the research community too little, and denigrating Green OA as dangerous socialism while introducing ever longer and unwarranted self-archiving embargoes to thwart it).

So while publishers may now be willing to give up their antiquated subscription model, they expect to be able to do so on their own terms, and with no adverse effect on their revenues and profits.

As to passivity and inaction within the research community, there is certainly a lot of that. Indeed, it is not clear to me that the wider research community *is* actually dissatisfied with the subscription system. OA advocates are very vocal, and they attract a lot of attention, but how representative are they of the research community at large?

You will recall that in an earlier Q&A in this series media research analyst Sami Kassab argued that the OA movement is not representative. In fact, he said, most researchers are happier with publishers today than they were a few years ago. And to support his argument Kassab pointed out that fewer researchers have signed the Cost of Knowledge boycott of Elsevier than signed earlier OA petitions.

Does he have a point? Possibly. Consider for instance that although Elsevier's decision to start sending take-down notices to services like Academia.edu, and then to individual universities like Harvard, California, and Calgary (demanding that they remove self-archived papers from their web sites) has seen the number of signatures on the Cost of Knowledge site grow to around 14,500, (increasing the number by 11%) this is still less than half the 34,000 researchers who in 2000 signed the PLOS open letter. And remember that the PLOS signatories were asking only that publishers make papers freely available after an embargo, they were not responding to an attack on their right to self-archive their own work. This suggests to me that the bulk of researchers have yet to be persuaded of the need to embrace OA, or indeed of the iniquity of Elsevier.

That said, what is new about the Cost of Knowledge protest is that it is an initiative begun and driven by researchers (specifically mathematicians), not by librarians, or the usual suspects in the OA movement. It is also noteworthy that these mathematicians are angry at publishers (notably Elsevier) because they believe subscription journals are unjustifiably expensive, and that by bundling serials into inflexible and non-transparent Big Deals (which force librarians to buy journals that their faculty do not even want) publishers are engaged in price gouging.

This anger has also seen the launch of the Mathematics Literature Project (designed to point researchers to freely available copies of papers, rather than to paywalled versions). And it has stimulated mathematicians to start creating their own publishing venues — e.g. the Episciences.org project and overlay journals like *Annals of Mathematics*. Significantly, the aim of the latter projects seems to be to remove publishers from the publishing process. Again, how representative these disgruntled mathematicians are of the wider research community is open to question.

As to whether publishers are parasitizing the public purse I guess the real question is whether they are providing value for money, or (as OA advocates maintain) making excessive profits by price gouging. Evidently, like many OA advocates, mathematicians have concluded the latter.

When responding to such claims publishers often argue that in a capitalist economy the notion of "excessive profits" is meaningless. However, my view is that this would only be a defensible position if the market for scholarly journals was a "true market". Speaking to me in 2002, anti-trust economist Mark McCabe argued that this is not the case — since there is no market mechanism to restrain prices.

Perhaps the best response to publishers who argue that profits can never be excessive in a capitalist system is the one Mike Taylor often gives, in which he cites Tim O'Reilly's advice to companies to "create more value than you capture".

> ***Q: Given rising demands for an integrated data, software and text infrastructure not only for archiving and making accessible all publicly funded research output, but also for developing content mining technology, what role, if any, do you see for publishers in this infrastructure?***

A: I'm not sure if it is what you mean, but I am going to take this as a question as to what future role I see for of publishers in scholarly communication.

When I interviewed BioMed Central founder Vitek Tracz in 2006 he suggested that as scientific papers become increasingly available outside paywalls publishers will have to reinvent themselves.

That seems self-evident, but the question is: how should they do this?

One option Tracz saw was that they could start building value-added databases around free scholarly content (both papers and data). As he explained, "A publisher could, for instance, focus on the bit of the carrot genome that makes it red. This could involve collecting all the papers written about that part of the carrot genome and then commissioning someone to write a commentary on those papers. This would synthesise the papers and explain their significance to that bit of the carrot genome. Then all the data — including the raw source data, the published papers evaluating that source data, and the commissioned commentary — would be structured in some electronic format designed to make it easy for researchers to use, to display, and to link to other relevant databases."

Tracz assumed that this secondary publishing market would be subscription based. As he put it, "[W]here today you have thousands of journals sold on subscriptions, in ten to twenty years there will be thousands of editorially intensive databases also sold on subscriptions, many of them probably sold by existing science publishers."

For me this is reminiscent of the patent information model I mentioned earlier, where secondary publishers wrap value-added data around freely-available patent documents and charge for access to the combined package.

I am aware, however, of claims that many researchers are reluctant to license their work under a CC-BY licence (See also this). If correct, Tracz's idea might raise licensing issues, since "re-enclosing" papers for commercial purposes in the way he envisages would presumably fall foul of non-commercial licences (which many OA papers could be released under).

I am also conscious that patent databases are pretty expensive and so primarily used by large commercial organisations. Whether the databases envisaged by Tracz might prove too expensive for the research community I do not know. What I do know is that to access patent information on proprietary services like STN International is far from cheap. STN users pay an annual subscription of €52 per user ID, plus a mix of connect charges, display charges and print charges. Accessing a premier patent database like Thomson Reuters World Patents Index (WPIDS), for instance, incurs an hourly connect fee of €640, plus display charges of €5.70 and print charges of €7.46 per record on top of that.

That said, like all proprietary information providers STN is having to adapt to the Internet. It has, for instance, developed a new web-based front end called STN Easy, which charges on a usage basis alone, and not for connect time.

More importantly, proprietary patent information providers have begun developing new software platforms where the value of what they provide lies not in the content, but in the analytical tools that come with it — e.g. the ability to examine, analyse and map patent data. In other words, as the value inevitably shifts from content to software, so information providers are having to morph into technology companies. That at least is how I interpret the development of products like STN AnaVist and Thomson Data Analyzer (A list of patent analytical tools can be found here).

I mention all this because one could imagine scholarly publishers taking the same journey. Indeed Elsevier's purchase of Mendeley would seem to point in that direction, as does its recent re-launch of SciVal, the announcement that it is partnering with Sciencescape, and its partnership with University College London (UCL) to create a Big Data Institute.[1] News that Wiley is forming a partnership with Knode suggests that it too may have embarked on such a trajectory.

Actually, I suppose one could argue that Elsevier first started out in this direction back in 2004 when it launched Scopus in order to compete with Thomson ISI (Web of knowledge). It is also worth noting that Elsevier sells patent databases itself, but now incorporates them into workflow solutions like Reaxys.

[1] The partnership is described as "a new collaboration to explore innovative ways to better serve the needs of researchers through the exploration of new technologies and analytics as applied to scholarly content and data."

All that said, I suspect your question goes to your belief (as I understand it) that much (if not all) of the next-generation scholarly communication infrastructure will be created and managed not by publishers but by the research community itself. And I think you anticipate that this will be funded through the cancellation of journal subscriptions.

I can see the logic here. After all, researchers are the creators (and thus owners) of the content in research papers (assuming they do not sign the rights over to publishers), and they are surely as (if not more) talented than publishers at many of the tasks associated with the publishing process — not least peer review, which after all is done by them not the publisher.

Moreover, as publishing is driven more and more by technology, and the different processes automated, the need to outsource the job to publishers might begin to seem moot. And after all, as you pointed out in your Q&A in this series, the Internet was created by the research community, not by corporations. So why should it not now build itself a new Internet-based publishing infrastructure?

It is however important to remember that scholarly publishers do more than simply gather, bundle and distribute content. And while they may not do the peer review themselves, they do manage the process. One could argue that it is important to have an independent intermediary act as honest broker between researchers when they are reviewing one another's work. I recall a senior publisher once justifying the role of publishers in the scholarly communication process in this way: "If it wasn't for publishers these people would end up killing each other".

But I would like to explore your idea further by speculating on how Green OA could develop (if it were allowed to).

As you know, the most vocal advocate for Green OA is Stevan Harnad. As I understand it, he believes that if researchers routinely self-archived a copy of every paper they published in a subscription journal in their institutional repository they could hope to achieve two objectives. First, they would provide OA to their research. Second, if the practice became widespread amongst researchers it would eventually trigger what Harnad calls a "leveraged transition" to a network-based publishing infrastructure.

This new infrastructure might be based on pay-to-publish Gold OA, free-to-publish-free-to-read Gold OA, or something very different (and perhaps far more radical). The important point is Harnad believes that if the research community embraced Green rather than Gold OA it would be able to force publishers to abandon those services they currently provide that are unnecessary in an online world, and so downsize their operations. This in turn would force them to lower their prices. As a result, the research community would not only get OA, but it would get it for less than it currently pays for journal subscriptions.

I won't go into the details of the process Harnad envisages. Suffice it to say that he believes the only service publishers would need to provide in a mature OA environment is that of managing the peer review process. And this, he suggests, could be done for around $200 per paper (i.e. significantly lower than today's pay-to-publish Gold OA).

As it happens, we are already seeing standalone peer review services emerging. Rubriq, for instance, provides such a service for $500 to $700 per paper. I believe Rubriq assumes that many of the papers it handles will go on to be published in regular journals, but it was recently announced that it will be providing outsourced peer review services to OA publisher QScience. We can doubtless expect to see further such announcements going forward.

The emergence of services like Rubriq suggests a possible direction that scholarly communication could take. More importantly, it would seem to confirm Harnad's view that in a networked world some or all of the tasks scholarly publishers perform today can (and surely will be) disaggregated, if not discontinued all together.

But disaggregation is just one consequence of scholarly journals going online and the move to OA. There is a much more interesting one, and it is this: as more and more research papers are deposited in institutional repositories we can see a potential new publishing infrastructure begin to emerge, as universities realise that their repositories need not simply be a place in which copies of papers published elsewhere are archived (as publishers and many OA advocates currently assume).

More specifically, as librarians see the content in their repositories grow, and as they become increasingly disgruntled at the prices that publishers charge for their services (both subscriptions and APCs) they will surely realise that they can use their repositories to create new low-cost journals, as researchers have been doing with content in the physics eprint server arXiv (e.g. *Annals of Mathematics*). In fact, some librarians are already doing this. Last December, for instance, the *Times Higher* reported that UCL is encouraging scholars to create "overlay journals" on top of its institutional repository UCL Discovery.

To facilitate this, UCL library has incorporated the open source software Open Journal Systems (OJS) into UCL Discovery. This allows the repository to act as a back-end storage system for new online journals, with OJS sitting on top of the repository software so that editorial boards can control the flow of manuscripts undergoing peer review, and handle the presentation of each issue of the journal.

An early example of such a journal is *Slavo*, which will be run by postgraduates of Slavonic and East European studies at UCL.

UCL is not the only university to see the potential here. A growing number of US universities are already publishing, or planning to publish, OA journals via their institutional repositories, including Yale University, Pacific University (Oregon), the University of South Florida, and Duke Law School.

Today the OJS web site indicates that over 6,000 journals are being published using its software, and doubtless many of these are being published by university libraries. Certainly Stellenbosch University in South Africa is doing this, as are many Australian universities. The National Library of Australia also hosts a good number of OA journals under its Open Publish program.

You will know that bepress has also developed a software package called Digital Commons specifically in order to enable journals to be published on institutional repositories. Currently around 300 journals are being published using Digital Commons in North America, most of which are OA journals.

From here it does not take much of a leap to see that universities could publish their own books and monographs too. And last year UCL "repatriated" UCL Press from a commercial publisher in order to do just that. Once again, UCL Discovery will provide the storage layer, with the publication process managed by a package called Open Monograph Press (OMP). Like mathematicians, it would seem, a growing number of libraries are not averse to removing publishers from the process of scholarly communication all together.

But did I not suggest that publishers might be essential for managing the peer review? I did, but not everyone agrees. Last year, for instance, professor of political science and public policy at the London School of Economics Patrick Dunleavy published a blog post arguing that universities could organize their own conventional peer review processes economically and effectively, "much as they do for PhD examining in the UK, using a system of mutual service and support."

In other words, Dunleavy believes that universities are quite capable of publishing their own books and journals without the involvement of publishers. "All the rest of the piece — getting articles publicized by twitter and blogs, providing a well-edited product, delivering the article to any PC, phablet or colour printer in the world — can be done easily and cheaply by universities themselves," he said. "Online communities are already doing the work of developing more and more research, so for universities to directly organize and publish their own peer reviewed journals, monographs and books is a natural next step."

Seen in this light, rather than propping up an outdated subscription system, Green OA begins to look more like a catalyst for new publishing solutions. Indeed, it is Gold OA that begins to seem stuck in the past, since all the majority of OA publishers are doing today is recreating the traditional journal. In most cases the only difference is that the journals are electronic pay-to-publish journals. It is my suspicion that in the not-too-distant-future this model will be dismissed as an irrelevant hangover from the print world.

As you know, many advocates argue that OA has nothing to do with reforming scholarly publishing. I think that is silly: to my mind OA is inextricably bound up with the urgent need to improve scholarly communication. So it would be a big mistake to miss the opportunity of reinventing the way in which research is shared at the same time as moving to an OA environment, both because of the potential cost savings, but also because of the opportunities it provides for leveraging the network to make scholarly communication more rapid, more effective, and more transparent.

Be that as it may, many now expect a radically different scholarly communication system to emerge sooner or later, and most of the changes anticipated depend on research (and the accompanying data) being OA. There is a growing view, for instance, that pre-publication peer review has become too expensive, slow and unreliable, and is now an impediment to effective scholarly communication. Consequently, many believe it should be abandoned.

On cue, we are seeing new services emerge to offer post-publication peer review — e.g. F1000, Libre, The Winnower, PubMed Commons and PubPeer. Some of these services assume that the papers they review have already undergone pre-publication peer review, but not all do. Whether many of the repository-based OA journals we are seeing emerge will abandon pre-publication peer review any time soon we cannot know. But if libraries are encouraged to be creative (and given the necessary funding) I believe we could see more innovation in publishing taking place in the library environment in the next few years than amongst traditional publishers (although it is possible libraries will want to outsource some of the work). What we do know is that post-publication peer review assumes that papers are freely available, and the arrival of new post-publication peer review services suggests another possible direction that scholarly communication could take.

Whatever happens, we might certainly wonder why anyone would want to cling to such a time and people intensive process as pre-publication peer review, particularly in light of the growing number of retractions, the so-called reproducibility crisis, and the increase in scientific fraud we are seeing. (In the latest scandal Springer and IEEE have had to withdraw more than 120 gibberish papers).

As the number of papers being published continues to grow by leaps and bounds we must also wonder at what point pre-publication peer review will simply become unmanageable. Writing in *Nature* last year, the researcher Jason Priem argued "In the late 1990s, commercial Internet services such as Yahoo! found that hiring experts to create vetted lists of web pages completely failed at Web scale; the same will be true of scholarship".

And again on cue, a range of new cost-effective technology solutions are becoming available to do much of the heavy lifting, allowing Priem to predict that in the future certification will take place in new ways — including by means of "algorithmic filters" to flag work to other researchers, as well as altmetrics such as number of page views, tweets and trackbacks. As a result, said Priem, there will be "a first-pass filter before manual curation."

In fact, Priem added, the very concept of "pre-publication" will eventually be forgotten. "Web-based dissemination increasingly pervades the research process. Conversations, data collection, analysis and description will be born published."

Viewed from this perspective, the scholarly journal begins to look decidedly dated. So too in fact does the notion of the "paper". This was another point Tracz made to me in 2006. As he put it then, "When we talk about papers we are imprisoned by the idea of something that consists of a discrete quota of information, mandated by the fact that there is only so much you can do on paper."

In future, Tracz added, a "paper" may be one sentence long or 1,000 pages long, it may contain a database or be linked to databases, and it will be constantly accumulating.

Significantly, he said, "You don't really need publishers for that, you need tools, and software development."

Traditional publishers have clearly been mulling over such possibilities too. Doubtless that is why Elsevier has been experimenting with the "article of the future" and its "executable paper" projects. Similarly, OA publisher eLife has been experimenting with its Lens project, and Wiley is working on the Anywhere Article.

But if publishers are going to have to think of themselves more as software companies than content providers, the time and effort involved in retrofitting the traditional paper for the online world might offer insufficient value to justify the cost involved, particularly if the paper is destined to disintegrate, or even evaporate. Like patent information providers before them, therefore, scholarly publishers may find that developing new tools able to mine, analyse, and map scientific data and research results offer more scope for the future — products like SciVal and Sciencescape perhaps?

As Sage Bionetwork's Christopher Bare has written, "The scientific paper has become something of a choke point. Unbundling the functions of a paper might allow more degrees of freedom for progress and innovation."

You will perhaps see from this why I believe that focusing on Green OA, and leveraging the potential of repositories as new publishing platforms, could offer more potential for building a new scholarly communication infrastructure than pay-to-publish Gold OA. At the very least, it would seem able to do it more quickly.

But to go back to your question: What role do I see for publishers in the modern scholarly infrastructure? Frankly, I do not know, and given the disruptive nature of the Internet I would hesitate to make any predictions.

Certainly they could face disintermediation — although I have to admit to some doubt over the degree to which the research community could manage the whole process itself. And while researchers may have created the initial Internet infrastructure, the network only became what it is today once it was commercialised and corporations moved in.

So while it is certainly possible that researchers could end up "taking back ownership" of scholarly communication (as Dunleavy implies) my suspicion is that even if we can agree that scholars have all the skills necessary to become their own publishers they might not be able to put aside their competitive interests sufficiently to be able to manage an effective, fair and adequate system. As the publisher I mentioned earlier pointed out to me, researchers have a tendency to fight with one another as often as they cooperate. The constant disagreement and infighting amongst OA advocates would seem to demonstrate as much.

On the other hand, I could envisage librarians replacing publishers as the new honest brokers of scholarly communication — which is perhaps what UCL has in mind. And this is what we are seeing at Amherst College and perhaps with the Lever Initiative.

That said, I see a number of possible futures for publishers. They could, for instance, downsize to providing just peer review services, as Harnad anticipates. Alternatively, they might become database providers in the manner predicted by Tracz. Or they could become pure technology companies, providing some parts of the new publishing infrastructure starting to emerge. And clearly they could end up playing a role in all these ways or none.

(In passing, I would note that bepress — more formally Berkeley Electronic Press — initially began as a publisher. In 2011, however, it sold all it journals to focus on providing technology solutions to enable the research community do its own publishing. These include Digital Commons and Selected Works. As such, bepress seems to me to be a good example of how publishers might morph into technology companies).

Finally, publishers may convince governments and research funders to protect them from the cold winds of change the Internet is blasting their way. In other words, on condition that publishers migrate to OA, governments might agree to ring fence their current profits. In my view, this would be a form of protectionism, and somewhat at odds with publishers' argument that their high profit levels are a natural, healthy, and acceptable feature of capitalism.

Nevertheless, this would seem to be the scenario RCUK envisages with its pay-to-publish Gold OA policy. Likewise, it is the model that David Willetts is hoping to persuade other countries to emulate, and it is the model that Sander Dekker hopes to persuade his fellow ministers and state secretaries in Europe to coordinate their national agendas around — as he explained to delegates at APE 2014.

Clearly, therefore, there is still a lot to play for.

> ***Q: How would you characterise the current state of OA, in Europe, North America, and globally?***

A: I would say that OA is at an important transition point. In an earlier Q&A in this series Portuguese librarian Eloy Rodrigues suggested two possible scenarios. One is what he calls a "research-driven" transition, "where research organisations and researchers assume a greater role and responsibility for disseminating and publishing their own results".

Alternatively, he said, we could see a "publishing-driven" transition to OA, "where costs, prices and profit margins all remain primarily in the control of publishers … there will be little incentive to reduce costs and prices … [and so] … OA could end up being little cheaper than the current model."

If Willetts and Dekker succeed in persuading other countries to follow the pay-to-publish Gold OA route taken by RCUK we could expect to see a publisher-driven transition, with subscription publishers suffering no loss of revenue as they reinvent themselves as OA publishers, and OA publishers able to increase their prices in the slipstream. For the research community it would mean continuing to pay inflated prices for the publishing services it currently depends on, and while journals would be freely available they might be little more than electronic versions of the traditional print journal.

On the other hand, if Willetts and Dekker fail to win the argument we could hope to see a research-driven transition and the possibility of a new scholarly communication infrastructure emerging along the lines I have outlined above.

As these two possible scenarios vie with one another we are witnessing a hard-fought struggle over the role of self-archiving and of repositories.

Finch concluded that the role of the institutional repository should be no more than that of "providing access to research data and to grey literature" and assisting in digital preservation, and so the main vehicle for providing OA to papers should be pay-to-publish Gold OA. And when RCUK introduced its Finch-specified OA policy this then became the official UK position.

As you know, however, following an outcry from the research community, RCUK eventually agreed to a five-year transition period, during which time Green and Gold will be equally acceptable ways of providing OA. Nevertheless, RCUK continues to express a preference for Gold and it insists that when the transition period ends the policy's original requirements will come into force, with repositories downgraded to archival tools.

Amongst other things, RCUK's concession has intensified a long-standing debate over whether and for how long papers that have been published in subscription journals should be embargoed before they are able to be made freely available. OA advocates believe there is no need for embargoes at all; publishers disagree, maintaining that they are essential if journals are to survive financially. They also argue that embargoes should be longer than funders assume and that only the publisher can estimate the appropriate embargo period for any particular journal.

As Elsevier put it in January, "Ideally, embargoes should be set on a title-by-title basis by publishers. However, we recognize that other stakeholders — in particular funders — seek influence over embargo lengths. Those funders are also approached by those who feel that embargos should be as short as possible, often six months or less. Like most other publishers, we do not believe that 12-month embargoes work for all journals or that six-month embargoes work for many titles at all."

The weakness of the publishers' argument is that there is no proof that embargoes have any impact on journal revenues — as OA advocates frequently point out. And when publishers do cite evidence to support their claims it generally turns out to be flawed evidence — e.g. the 2012 ALPSP survey.

Nevertheless, to the great frustration of OA advocates, publishers often win the embargo argument. Thus while RCUK initially proposed embargoes of 6 and 12 months (12 for HSS papers), these times were subsequently doubled in response to publisher lobbying. Likewise, where in 2000 scientists had called for OA with a 6 month embargo, when it introduced its Public Access Policy the National Institutes of Health (NIH) gave in to publisher lobbying and allowed a 12 month embargo.

The conflict over embargoes has been especially fierce in North America, where the US government has tended to support Green rather than Gold OA. The latest shot in the war of words on embargoes came in the shape of a study on the half-life of journal articles by Phil Davis. Publishers immediately began to cite the study as evidence of the dangers of self-archiving, especially where funders demand short embargoes. Commentators like Suber and Duke University's Kevin Smith, however, remain sceptical. Smith, for instance, argues that journal half-life tells us very little about embargoes.

But embargoes are not the only source of disagreement over Green OA. Last year's OSTP Memorandum triggered what I believe to be a more significant battle, one whose importance increased with the Omnibus Appropriations Bill.

The issue here is who gets to provide access to scholarly papers once they have been released from behind the paywall. Conscious that US federal agencies might respond to the recent calls to embrace OA by creating their own repositories (as the NIH did in 2000 when it created the biomedical and life sciences repository PubMed Central), publishers have formed a partnership to create what they call the Clearinghouse for the Open Research of the United States (CHORUS).

The aim of CHORUS is to persuade OSTP and the relevant agencies that, rather than attempt to provide OA themselves, US federal agencies should outsource access provision to publishers. This would mean that when someone wanted access to a free copy of a federally-funded paper they would be directed not to an OA repository, but to the "version of record" hosted on the publisher's site.

For their part, US librarians have proposed the SHared Access Research Ecosystem (SHARE). Described as a "federated system of university repositories", the aim of SHARE is to position librarians as the preferred gatekeepers of OA papers. The vision here is that if someone wants access to a publicly-funded research paper they should be directed to the final peer reviewed manuscript deposited in a relevant OA repository, not to the publisher's site. SHARE could also incorporate repositories like arXiv and BioRxiv into its distributed infrastructure, along with any federal repositories that might emerge.

Others maintain that all federally-funded research papers should be deposited in PubMed Central (which already hosts 3 million articles). This is what palaeontologist Mike Taylor suggested in an earlier Q&A in this series. Explaining why he preferred PMC over SHARE or CHORUS, Taylor said, "Of the two, libraries are obviously more aligned with the world's interests than publishers are; but since the government exists in order to represent citizens, it [PMC] seems like the safest bet."

We should not doubt that any attempt to use PMC in the way suggested by Taylor would be fought tooth and nail by publishers, since for them PMC epitomises the deeper threat they perceive from Green OA: the likelihood that the growth of OA repositories (both large central repositories like PMC and networks of institutional repositories similar to SHARE) will eventually disintermediate them. CHORUS is a response to this perceived threat, and it was this fear of disintermediation that led publishers to lobby aggressively against PMC when it was first proposed as E-Biomed by the then director of the NIH Harold Varmus in 1999. By arguing that E-BioMed was an attempt by the US government to interfere in a free market by becoming a publisher itself, publishers succeeded in having E-Biomed emasculated and released as the less ambitious PubMed Central. Even so, PMC has become scholarly publishers' *bête noire*.

Given the high stakes involved, it is no surprise that the US legislature has also been drawn into the struggle over Green OA. As you know, in 2011 publishers supported the (unsuccessful) Research Works Act, which would have had the effect of reversing the NIH policy and preventing other US federal agencies from imposing similar requirements on researchers (as is now proposed by OSTP). And this month the Frontiers in Innovation, Research, Science, and Technology Act (FIRST) was introduced into the US House of Representatives. Also supported by publishers, FIRST would, amongst other things, permit embargoes of up to two years. It would also allow federal agencies to comply with any OA policy by means of links to publishers' sites; they would not have to host papers themselves. These links would presumably be managed by CHORUS.

What I take from all this is that while the rationale and length of Green OA embargoes has always been a hotly contested issue, publishers' real concern is that OA repositories will inevitably become full-blown publishing platforms, and so cut them out of the publishing process. By insisting that access to OA papers should be provided by them, rather than by OA repositories, they hope to remain firmly embedded in the system.

In answer your question as to how I would characterise the current state of open access, therefore, I would say that we have seen a shift from a discussion about *whether* open access should be adopted by the research community to one about *how* it should be done. Specifically, who gets to decide how OA is implemented, and who manages access provision in an OA world. This in turn raises the larger question of who gets to define and manage the new scholarly communication infrastructure that will surely be needed in the networked world. That at least is current state of the *debate* about OA as I see it.

I have discussed OA mainly in terms of the US and UK. But I think it safe to say that the same issues are currently playing out in all research intensive countries. For instance, we can see similar tussles taking place on a national scale in countries like Italy and Germany, on a regional basis via organisations like the European Research Council and Science Europe, and on a global basis via the Global Research Council. In short, since publishers are determined to remain the arbiters and controllers of scholarly communication every new OA initiative or policy becomes a source of conflict and controversy.

What is most contentious I think is publishers' assumption that they should continue to control access to research papers even after they have been released from behind the paywall and made freely available on the Web. This conflicts with a growing view within the research community that in an OA environment publishers should be treated as service providers alone, and so should have no say over how a paper is accessed once it has acquired OA status.

Indeed, the bold and bullying manner in which publishers continuously assert their right to call the shots is causing some in the research community to question whether publishers should have any role in scholarly communication in the future.

Either way, it is hard not to conclude that if the research community wants to have greater control over its output in future it is going to have to start building publishing solutions itself. And fortuitously these solutions are beginning to emerge naturally from OA repositories, as I have indicated.

What about the developing world? Here there seems little doubt that the repository is set to play a central role in the provision of OA — but with an interesting twist. While at first sight they may appear to be no more than repositories, for instance, platforms like SciELO and Redalyc (Latin America), and AJOL (Africa) are in effect publishing platforms more than archival tools. They were created not to enable researchers to self-archive papers they have published in subscription journals, but to put local OA journals online and aggregate them in order to increase their global visibility.

As such, explained SciELO co-founder Abel Packer in 2009, SciELO has always had an online publishing capability. "In some cases the SciELO coordinating organisation takes full responsibility for all the online publishing after receiving the text files from their journals. In other cases, journals do the markup and then send the files to SciELO ready for publishing."

SciELO would therefore best be described as a repository-based OA publishing platform. As such, it directly challenges the Finch view of what a repository ought to be, as it does the view of many OA advocates. As Packer put it, "SciELO incarnates the most successful and impressive example of 'Gold OA', that is, open access based on publishing rather than self-archiving; at the same time, its database acts like an open-access depository."

There is another twist too. When Packer describes SciELO as an example of Gold OA, he is not talking about pay-to-publish Gold OA as understood by publishers in the developed world. He is talking about no-fee Gold OA publishing — or what some have come to call Platinum or Diamond OA. This is possible in Latin America, Packer explained, because the costs of maintaining services like SciELO are viewed by governments in the region as part of the "publicly funded research infrastructure". In other words, the costs do not have to be supported by a range of "business models" that are subject to the brute necessities of "the market" (and so have to generate large profits for commercial organisations). Most SciELO journals are produced not by commercial publishers, but by non-profit organisations. As Packer explains, "almost all the quality journals indexed by SciELO are published by non-profit institutions, such as scientific societies, universities, research institutes and other public institutions."

AJOL is similar. In fact, as noted in the Michelle Willmers Q&A in this series, some of the journals hosted on AJOL do not even have their own web sites, but manage the entire publication process directly on AJOL (using OJS).

The real point of interest here perhaps is that SciELO and AJOL have been doing what UCL and Yale plan to do for some time now, with the difference that the former are central repositories that aggregate journals from a range of non-profit publishers and research institutions, while the latter are (as currently envisaged) institutional publishing platforms.

This invites a few questions: as university repositories in the developed world begin to partner and to aggregate one another's content (sometimes in shared repositories), and as they begin to publish their own journals *à la* UCL and Yale, do they at some point become new SciELOs and AJOLs, both in form and function? And when does the content in all these services grow to encompass not just journals, theses, and books, but newsletters, presentations, conference proceedings, scientific data, post-publication reviews, blog posts, scholarly conversations and commentary, along with forms of scholarly content as yet unknown? And at what point does the growth of these repositories become a serious threat to scholarly publishers?

What is clear is that platforms like SciELO and AJOL imagine a very different future for OA publishing than the one currently being promulgated by RCUK, David Willetts and Sander Dekker.

Here then we have Rodrigues' two possible futures. Leaving aside issues of cost and control, what strikes me as drab and dull about the publishing-driven model is that it is essentially backward looking, apparently promising little more than the traditional journal ported to the Web. Freely available and billed differently for sure, but still a model from yesteryear.

By contrast, what I find exhilarating about the research-driven model is that it is future focused, and so has the potential to produce forms of scholarly communication more suited to the networked environment. It is not trapped in the past and required to generate revenues able to sustain large existing publishing infrastructures. In short, it holds out the promise of a new 21st Century scholarly communication system, not a retrofitted 20th Century system whose primary purpose is to protect publisher incumbents from downsizing, or even perhaps redundancy.

If nothing else, if Harnad is correct, we could expect a rapid growth in repository content to put publishers on their back feet, and force them to become service providers rather than gatekeepers of the process. It may not be necessary for the research community to do its own publishing, so long as can take control.

Q: What still needs to be done, and by whom? Specifically, do you have a solution to the access problem (or an argument against) that was not mentioned by any of your interviewees, but that might prove critical?

A: I do not think I have any new access solutions to offer, but perhaps your question gives me an opportunity to make the point that I believe a further drag on the development of OA has been the abiding confusion over whether OA is intended to solve the *affordability* problem that libraries have long experienced as a result of the serials crisis, or the growing *accessibility* problem that researchers have faced when trying to access their peers' work.

OA advocates assumed that OA would solve both problems. But in focusing exclusively on the *accessibility* problem I believe they took their eyes off the more fundamental problem confronting scholarly communication today — *affordabilit*y.

In theory, OA *should* solve both problems, since the phasing out of print and the increasing automation of the publishing process that the network and OA facilitate would seem inevitably to reduce costs, and thus lead to lower prices. Yet as I noted earlier, it is far from clear that OA publishing will prove any less expensive than subscription publishing, especially if pay-to-publish Gold OA becomes the norm, if APCs are paid by means of block grants, and if Hybrid OA is used as a transition strategy — as currently seems likely in the developed world. I do not see how this can create any more functional a market than subscription publishing, because the same disconnect will exist between the person who uses the service and the person who pays for it. People don't really care about costs if they do not have to pay the bill themselves, so there is no market mechanism here likely to restrain prices.

Given that the *accessibilit*y problem is a consequence of the *affordability* problem, not *vice versa*, my view is that *affordability* is the real problem. If the global research community could afford to buy subscription access to all the research it needed there would be no *accessibility* problem right?

Ironically, for librarians the *affordability* problem might go away, since a view has emerged (promoted by private funder The Wellcome Trust) that in an OA environment publication costs should be treated as part of the cost of doing research, and so paid for by funders. This shifts the *affordability* problem from the library to the funder. It does not, however, solve it.

I realise some argue that digital publishing is in fact no cheaper than print publishing (a claim about which I am sceptical). But even if that is so, the point surely is that the serials crisis arose as a result of the research community's inability (or unwillingness) to pay the costs of the scholarly communication system as currently priced. If pay-to-publish Gold OA means no more than shifting the cost burden — as Willetts/RCUK envisage — how will the fundamental problem (*affordability*) be solved? (This point was made by the University of Sheffield's Stephen Pinfield last year). Bear in mind also that if funders pick up the publishing bill it will inevitably mean less money to spend on research.

I suspect this issue was overlooked by the OA movement precisely because it allied itself with OA publishers. After all, publishers (whether for-profit or non-profit, subscription or OA) generally want their services to be priced as high as possible and most want to see that price continue to rise as fast and as much as feasible. In inviting publishers to help develop OA strategies, therefore, the OA movement has ended up paying too much attention to the needs of publishers, and too little attention to the needs of the research community.

But to address the first part of your question: What still needs to be done and by whom? I will answer this by saying what I think OA advocates in particular should be doing.

First, I believe the movement needs to be much clearer and more transparent about the *accessibility / affordability* issue (e.g. how can OA address both issues, not just one. Can it?) More specifically, do OA advocates really believe that OA *will* be less expensive than subscription publishing? If so, how and why, and what are the implications if it is not? If not, for instance, how will the research community afford to communicate its research in an OA world, particularly if

Hybrid OA and block grants become widespread, and prices rise inexorably as a result? Will fewer papers have to be published? Or will it mean less and less money is available for actually doing research? Alternatively, might the research community have at some point to conclude that publishers are too expensive and so — now that they can be — should be disintermediated? As journals and research papers start to give way to new forms of scholarly communication should we assume that publishers will become supernumerary in any case?

I know that a number of European funders have recently tried to address the issue of how an effective market can be created for OA publishing, commissioning Bo-Christer Björk and David Solomon to produce report setting out a number of options. The authors conclude that the market for pure Gold OA is functional but that the market for Hybrid OA is not, and they propose ways in which funders could try to foster a more transparent and competitive market. Personally, I am sceptical as to how effective such schemes could be — as, it would seem from a *Times Higher* news item, are the authors themselves. And if Hybrid OA is not functional, it is unclear to me how pure Gold OA will be functional in the future, since the high cost of Hybrid OA will surely raise up all Gold OA boats (Solomon expands on his concerns about Hybrid OA here).

It is also noteworthy that a year or so ago these same two authors were widely cited for estimating that the average APC costs were just $906. In the latest report they cite a figure of $1,418, 56.5% higher. True, the latter report uses a different set of journals, but it underlines the problem of trying to assess current APC costs, and then predict future costs, in such a volatile environment, particularly when Hybrid OA is only just beginning to kick in. As Solomon apparently concedes, significant doubts must remain as to whether OA publishing costs can be effectively controlled.

My second point on what needs to be done is a reiteration of what I said earlier: the OA movement needs to distance itself from publishers, be they subscription publishers or OA publishers. As it happens, some OA advocates are concluding that scoping and commissioning a new network-based scholarly communication system is a task for the research community alone. To treat publishers as stakeholders, they argue, is to give them too much power; power that they have shown themselves willing to abuse. I think this is a valid point.

We should not doubt publishers' determination to continue controlling scholarly communication. And we can see that they are now keen to take over the OA infrastructure too. This was evident in the recent exchange on *The Scholarly Kitchen* blog about the neglected state of ROARMAP. To the annoyance of Harnad, publishers were quick to propose (e.g. here and here) that the tasks associated with indexing and monitoring OA policies should now be passed over to them (for which they would require "community funding").

As it happens, funding for ROARMAP may be forthcoming from the EU but, as noted earlier, the fact that the service fell into neglect demonstrates the limitations of the way in which the movement has organised itself, and the potential consequences of that.

My third point is another restatement: I believe the OA movement needs to become more organised, to speak with one voice, and to desist warring with itself!

As I also noted, this last point is in my view important because it has become evident that if scholars sit around waiting until OA is forced upon them they are likely to have to adopt it in a less pleasing way than they would if they were to embrace it on their own terms now.

We have seen what has happened in the UK. And we can see the threat scholars in Holland now face. As Dekker has warned, if Dutch researchers don't act voluntarily they (like UK researchers) will have OA forced upon them. Specifically, Dekker has said that if there has been no progress by 2016, "I imagine that the obligation to publish Gold OA will be included in the Law on Higher Education in the 2016 Open Access and Research Act (WHW)." (Jeroen Bosman translation). Judging by the response of UK researchers, I think it safe to assume that this would not be welcomed by the Dutch research community. Indeed, as the long-term implications of the RCUK's pay-to-publish Gold OA policy begin to sink in the message for researchers everywhere is surely "Act now or repent at leisure"!

I find it hard not to conclude that if OA advocates had galvanised the research community earlier then governments would be far less likely to be intervening now. And we have learned that government intervention is a decidedly mixed blessing. This suggests to me that the urgent task confronting the OA movement today is to come up with a coherent and compelling argument able to persuade researchers to adopt OA on their own terms now — before it is thrust upon them.

I also think the OA movement should restrict itself to giving practical advice, something it is not overly good at. Recent calls for researchers to stop publishing in prestigious journals in favour of OA journals, and to ignore the impact factor, is a case in point. Exhortations like this are particularly impractical when directed at early career scholars. After all, for so long as university administrators and funders reward researchers handsomely for publishing in journals like *Science*, *Nature* and *Cell*, why would young scientists agree to boycott them? Effectively, they are being asked to cut off their nose to spite their face.

Besides, it is not even necessary, since scholars can continue to publish in subscription journals (for free) and then make their papers OA by self-archiving them in their institutional repository.

In short, the movement has been very good at making high-sounding declarations and statements, penning fiery blog posts, and calling on colleagues to take a moral stand on OA, but far less good at giving practical help and advice. While filling the airwaves with upbeat messages about OA has its plusses, exaggerating progress, and ignoring evidence that things are not as rosy as OA advocates might like to think, can be a dangerous strategy once people (especially governments) realise that many of the claims being made about OA are overblown.

So what exactly should the OA movement be advising the research community to do? As a chronicler rather than an advocate, it is not really my job to say. Nevertheless, I offer some thoughts.

As I noted, most universities still have no OA mandate in place today. Where mandates do exist they are very often little more than expressions of support for OA, guidelines, polite requests, or what Anderson refers to as simple proposals; they are, as Anderson puts it, *not real* mandates. They may produce a feel-good effect, but they achieve very little in practical terms. I would suggest, therefore, that much work could still to be done here, and the OA movement could do worse than start to distinguish real mandates from “not real” mandates.

As I see it, OA policies are important because if repositories are to avoid being marginalised they need to be filled with as much content as possible, as quickly as possible. In fact, I would go so far as to say that it is time to stop encouraging scholars to pay to publish in OA journals, but tell them instead to simply continue publishing in subscription journals and then self-archive. As Dekker pointed out, researchers are confused by the flood of conflicting advice about OA being thrust at them. When people find themselves being pushed in lots of different directions at once they usually dig their heels in and choose to do nothing. Why not keep the message simple and focus on Green OA?

Leaving aside any cost issues, the more I think about it the more convinced I am that in promoting pay-to-publish Gold OA the OA movement made a strategic error. I realise some OA publishers are experimenting with open peer review, with altmetrics, with the provision of underlying data, and with the journal/paper format, but the fundamental assumption of Gold OA (certainly as envisaged by RCUK/Wellcome etc.) is that all that is required to adapt scholarly communication to the 21st Century is to port the traditional journal to the online environment, but make papers freely available by shifting the costs from the end of the publication process to the start of the process. Since keeping the traditional vessel of the journal intact offers publishers the best chance of migrating their current high profit levels to the OA environment we should not be surprised that they are keen to cling on to it. But is that to the benefit of the research community?

Another way for universities to fill their repositories, of course, is to follow the example of UCL and Yale, and start publishing their own journals (and books). Combined with self-archiving, this seems to me to offer a far better way of transitioning to a network-based scholarly communication system than paying thousands of dollars per article to publish in Gold journals. In addition to the advantages I have mentioned, by publishing their own journals those researchers who wanted to could make their work available as libre OA.

I also think that it is time for OA advocates to refocus their lobbying efforts on university administrators and researcher themselves, not on governments and funders. The latter have shown themselves to be highly susceptible to publisher influence, not just because the advice and recommendations they get from OA advocates is sometimes confused and contradictory, but because publishers have terrified politicians into believing that Green OA will destroy the scholarly communication system.

I think one can see how effective publisher lobbying has been if one considers the way in which government and funder policies have changed over time. As you know, the first significant government mandate was NIH's 2005 Public Access Policy, which requires funded researchers to post their papers in PMC. There seems little doubt that the sole purpose of introducing the NIH policy was to ensure that publicly-funded research is made freely available by means of Green OA. While the policy does not prohibit researchers from publishing in Gold OA journals (so long as the resulting papers are deposited in PMC), and while it allows publishers a 12 month embargo, the NIH policy is a classic Green mandate.

There is also no doubt that the NIH policy has been very successful. However, I would argue that this reflects the determination of a number of highly-motivated individuals within NIH to take on subscription publishers. While the US government may support the principle of OA, I do not think it has a philosophical or ideological commitment to Green OA specifically. It is also worth pointing out that the NIH policy was formulated in the way it is because PMC was envisaged as a biomedical and life sciences equivalent of the physics eprint repository arXiv, which was created in order to enable researchers to self-archive their papers, not as a form of publication. In other words, in the early days Green OA was the only game in town.

Moreover, while we have seen new Green OA initiatives emerge from the US government over the last year, these too could be said to reflect a general commitment to openness, not a specific commitment to Green OA. I suspect they are also not quite what OA advocates claim them to be. Thus while the OSTP Memorandum exhorts federal agencies to draw up plans for OA, it appears to be more of a recommendation than an obligation, which is perhaps why there is no obvious sense of urgency amongst the agencies to move ahead. And while the OA requirements in the Omnibus Appropriations Bill *are* obligatory, they are time-limited — to just one fiscal year according to Suber (See also here).

In the meantime, in other developed countries the tide is turning visibly away from Green OA. No doubt one could analyse mandates in a number of different ways, but it seems to me that we are witnessing a gradual shift of emphasis, from Green to Gold OA, with a growing sense that Gold OA is the only "proper" form of open access, and Green OA an unsatisfactory and high-risk half-way house. If I am right, this shift is undoubtedly a consequence of publisher lobbying.

So where OA policies were initially solely Green, today researchers are generally allowed to choose between Green and Gold — e.g. the policy introduced by the European Commission for its Horizon 2020 programme, and the policies introduced in countries like Italy and Australia. However, the stress is increasingly on Gold OA. In that light, the RCUK policy is not an outlier but the next stage in the inevitable marginalisation of Green OA. And to accelerate this process of marginalisation publishers have responded to the RCUK policy by lengthening their embargos. The logical conclusion of this process would seem to be that (at some point) Green OA will be declared an ineligible form of OA.[2]

Meanwhile, we should not doubt that considerable political pressure is being placed on other countries to follow the UK lead, and the Netherlands looks set to be the first to do so. The pressure on other countries will be all the more intense given that the UK (and Holland) realise that a pay-to-publish Gold OA policy can only really succeed if all (or most) research intensive countries follow suit. Quite simply, if other countries do not adopt the same strategy, these two countries will

[2] While in theory the expected green OA policy from the Higher Education Funding Council for England (HEFCE) might be seen to buck this trend, the fact is that when the RCUK transition period ends HEFCE's policy will become moot, since RCUK will require researchers to pay to publish in Gold OA journals regardless.

struggle to fund their policies. For instance, if Holland follows suit one estimate predicts that a Gold OA preferred policy would see its annual publishing costs rise from €34 million (subscription) to €43 million (OA). In addition, for so long as other countries do not follow suit the UK (and Holland) will have to pay both APCs and subscriptions. So we can be sure there will be a great deal of lobbying and arm pulling taking place behind the scenes — not just by publishers now, but by the UK and Dutch governments too (see here for just one small example).

It also seems reasonable to assume that subscription publishers will not be shy to point out to the US government that as a result of the UK policy scientists are now (or, as subscription publishers rush to offer Hybrid OA, soon will be) able to publish in whatever journal they want and yet be able to make their work OA (either via pure Gold or Hybrid OA). As such, publishers will likely add, Green OA policies are no longer necessary, and so a source of unnecessary conflict and bickering. Moreover, they will surely ask, does the US government really want to bring down on its head further allegations that — by encouraging federal agencies to create new PMC-like government repositories[3] — it is trying to destroy the publishing industry? At the same time, the British and Dutch governments will doubtless be pointing out that Gold has the advantage of providing immediate (not embargoed) OA, and libre OA advocates will be continuing to complain that Green OA does not provide the reuse rights they believe are now essential for science. Faced with this multidirectional pressure one could easily imagine the US government deciding to convert its Green OA policy to a Gold policy.

It is also worth speculating over what proportion of papers deposited in PMC today have in any case been published as Gold OA, and whether the ratio is growing, which I assume it must be.[4] Moreover, given that publishers are now able to offer CHORUS as an alternative to PMC, the rationale for the US government to continue paying the estimated $4.45 million running costs for PMC might seem increasingly questionable.

So while the NIH policy has been hugely important and influential, governments in the rest of the developed world are likely to wonder whether the NIH model is past its sell-by date. Might the US government now be wondering about this too?

I dare say some OA advocates would argue that the above scenario would be a satisfactory conclusion to the OA movement's quarter century of campaigning. But it would not have solved the *affordability* problem. Moreover, publishers would still be in control of scholarly communication. So publishers would have won the OA war, and they would have done so at the expense of the research community.

> ***Q: Is there a single most important task that the OA movement should focus on today, or are there several steps that need to happen at once or in sequence?***

A: I have mentioned the tasks I think are pressing. In my view the most important of these is for the OA movement to find a way of articulating and promulgating a coherent, practical, and compelling OA strategy. This is necessary if they are to persuade researchers and research institutions to embrace OA on their own terms before they are compelled to embrace it on someone else's. As I say, I believe this would require the creation of a global OA organisation committed to participation and which did not include publishers in its membership.

I realise, however, that it may be too late for such an organisation to emerge, not least because the unofficial leaders of the OA movement could be expected to resist any change to the *status quo*, lest they be displaced in the process. In addition, publishers have now firmly established themselves in many of the organisations that advocate for OA. They have managed to embed themselves in the OA movement.

But however they do it, OA advocates will need to win the hearts and minds of the research community if they want to avoid the future envisaged by Willetts and Dekker. I really don't know

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[3] The memorandum states, "Repositories could be maintained by the Federal agency funding the research"
[4] When I spoke to NIH in 2012 I was told that it does not distinguish between Green and Gold deposits

how likely that is. If by the time the RCUK transition period comes to an end it was apparent to all that repositories were replete with research papers, that they were fully interoperable, and that they were overflowing with exciting new OA-based forms of scholarly communication I guess governments might find it harder to insist on a pay-to-publish Gold OA future.

If they want to play a part in the future scholarly communication infrastructure there is a real challenge here for librarians as well. I note that a survey of library directors and researchers undertaken at the end of last year by CIBER found that librarians and researchers are not on the same page over repositories. As CIBER put it, "there seems to be a stronger feeling by the researchers that 'gold' open access will replace 'green,' and that within the repository movement itself, subject based repositories are better placed than institutional repositories to meet their needs. This differs from the views of the library directors, which show a higher rating of institutional repositories."

Q: What are your expectations for OA over the next 5 years?

A: As I say, wherever one looks today one sees a movement in transition. By the time RCUK's transition period expires I would expect us to know whether the scholarly communication system is going to continue to be managed and controlled by publishers, or whether the research community has found it in itself to get into the driver's seat and begun moving full speed ahead to create a system in its own image. As the struggle plays out there will be an increasingly fierce debate over the role that institutional repositories should play in the OA publishing ecosystem.

Clearly the outcome will depend on what the various actors do. Governments and research funders are very important, but since they appear to be increasingly fixated on Gold OA anything they do is more likely to smooth the way for publishers. On the other hand, if university administrators and researchers chose to act perhaps they could ward off further government interference and out manoeuvre publishers. As I said, I do not know what role publishers ought to play in a networked world, but unless the research community takes charge publishers will likely write their own job description.

However the OA drama plays out, I cannot help but think that the traditional journal — along with the traditional scholarly paper — must sooner or later wither away. For this reason alone, a business model based on a per-article charging structure makes little sense, particularly if Tracz is right to predict that what today we call an "article" may at times be little more than one sentence long!

When people first made movies and TV drama they attempted to squeeze new wine into an old bottle — by using the structure of the theatrical play. Later they adapted to the new medium. How long can it be before the logic of the network imposes its own necessities on scholarly communication, regardless of the wishes and actions of governments, of research funders and of publishers? But it would be a great shame if this natural process of adaptation were to be unnecessarily delayed simply in order to protect the profits of a bunch of recalcitrant 20th Century publishers.

A final point I would make is this: both the way in which research is conducted and the way in which it is communicated has until now been dictated by the developed world, generally to the disadvantage of the developing world. (See here for an example). As a result, researchers in the Global South have, to one degree or another, been locked out of what Jean-Claude Guédon likes to call "the Grand Conversation of science." Pay-to-publish Gold OA does not solve this problem for them; it simply changes the nature of it.

In other words, while pay-to-publish OA might eventually allow researchers in the Global South to *read* most or all third-party research published, it would make it increasingly difficult for them to *publish* their own research. And I don't believe APC waiver schemes can address this problem, not least because once requests reach a certain level publishers will inevitably start to scale back the number they allow. This is all the more likely given that many waiver eligibility rules are decidedly non-transparent, so publishers would be able to run their programmes down quietly.

This draws our attention to the fact that what is really lacking today is a global strategy. Speaking to me earlier in this Q&A series Dominique Babini said "[W]e owe ourselves a global discussion about the future of scholarly communication. Now that OA is here to stay we really need to sit down and think carefully about what kind of international system we want to create for communicating research, and what kind of evaluation systems we need, and we need to establish how we are going to share the costs of building these systems."

That sounds like a great idea to me. But as Babini implies, any such discussion would need to address the requirements of all researchers, not just those in the Global North. Unfortunately, the way in which governments and funders in the developed world are currently inclined to implement OA takes very little account of developing world needs, particularly with their increasing emphasis on pay-to-publish Gold OA.

One might think that OA advocates would be the natural organisers of a global discussion on this. Yet I am not convinced they appreciate what is required either. At the start of the year, for instance, a couple of US-based OA advocates began circulating a White Paper proposing a "transformative rethinking of open access publishing". The document makes some very good points, and expresses a desire to develop a solution "not bound by national borders". If one scans the acknowledgments in the paper, however, one discovers that the overwhelming majority of the 80 plus people who provided input are based in the US. Those few who are not appear to be UK based. Most strikingly, the only person from the developing world consulted was Dominique Babini. I am sure this is not what Babini had in mind when she called for a global discussion.

Were such a discussion to take place I would anticipate it concluding that the ideal platform for a global scholarly communication system is one based on networks of institutional repositories. And I would not be surprised if it did not conclude that services like SciELO, Redalyc and AJOL have much to teach us.

It is also worth noting that it was with the aim of creating distributed networks of interoperable repositories that in 1999 the OAI-PMH protocol was developed. Much work has gone on since then, but it is from this early work that initiatives like COAR and OpenAIRE (a European a network of repositories) have emerged. In addition, open source software like OJS and OMP have been developed to allow low-cost repository-based publishing. In other words, much of the technology needed has already been developed and is freely available.

I think the greatest obstacle to the global solution that Babini wants is a philosophical one. So where in the Global South it is generally assumed that governments have a direct responsibility to provide the facilities that researchers need both to conduct and communicate their research, in the Global North there is an increasing emphasis on market solutions. As a result, suggested professor of sociology John Holmwood last year, OA is being held hostage to "broader neoliberal policies". One consequence of this is that governments in the developed world are supporting OA not because they believe in openness, but because they expect it to provide short-term economic benefits. This fixation with markets presumably explains some strange ironies in the way the UK government is pushing the OA boat. While it is calling for research to be made freely available, for instance, it is doing all it can to avoid OA having any negative impact on the profits of the publishing industry. Even more ironically, at the same time it is introducing ever-higher tuition fees for university courses — so people will be able to access as much research as they want, but many will struggle to get an education.

This same philosophical difference was evident in something the Head of Library Services at the American Development Bank Norma Palomino wrote recently. Describing the impression she and a group of Argentinian libraries formed when they visited Stanford University in 1999, she wrote, "We found it ironic that in America open access to knowledge is seen as a solution to an economic problem, while in Latin America the main motivation is to democratise knowledge as a healthy effect of our nascent democracies."

Given these philosophical differences it seems unlikely — in the short term at least — that we will end up with a global scholarly communication infrastructure. Rather it will be a bipartite system, with the developed world likely to opt for a system based on pay-to-publish Gold OA journals and the developing world adopting repository-based systems that build on the work of SciELO. (In addition, we are seeing regional networks of institutional repositories like La Referencia emerge).

Costs aside, the plague of predatory publishers (to which researchers in the Global South appear to be most vulnerable) is making pay-to-publish a very hard sell outside the US and Western Europe. As the Serbian National Library's Biljana Kosanović told me last year, "there is currently a negative public perception of the APC model in the [Southeast Europe] region. This is partly because of recent events related to the so-called predatory behaviour of some publishers. This has definitely slowed down the process of Serbian journals moving to the author-pays economic model."

The situation is perhaps not dissimilar in China. In a recent paper Dr Xiaolin Zhang, from the National Science Library at the Chinese Academy of Sciences wrote, "It now seems that 'green' OA, author self-deposit of papers from publicly funded projects, will be the policy focus … As for 'gold' OA, support for OA APCs through authors' R&D funding will continue, but institutional payments of APCs to OA publishers can be slow to realize, due to concerns over predatory behaviours and cost transparency."

What I find particularly interesting is that SciELO's experience suggests a repository-based system holds out the promise of delivering the Holy Grail the research community has long been seeking: a system able to solve both the *accessibility* and *affordability* problems.

Consider, for instance how much it costs to publish a paper in SciELO. "[I]f the complete editorial flow, from the reception of manuscripts, the peer-review process, editing, and the online SciELO publication is taken into account, the total cost for each new SciELO Brazilian collection article is estimated to be between $200 and $600", Packer explained in 2009.

How this will play out in the long term I really do not know. Nor do I know what historians of scholarly communication will say about the OA revolution. What I do know is that the writer and critic Walter Benjamin has said that history is written by the victors. I have said that OA to research is inevitable but that there are two possible outcomes. So I will close with a question:

> When the history of open access is written will it tell the story of a group of high-minded individuals who, in the teeth of fierce resistance from publishers, tore down the paywalls surrounding publicly-funded research? Or will it give an account of how a highly innovative publishing industry exploited the benefits of the digital network to set research free?

The answer to that question will surely depend on who wins the OA war.

But to end on a bright note: whoever wins the current OA war the world now looks certain to get OA!

Earlier contributors to this series include palaeontologist Mike Taylor, cognitive scientist Stevan Harnad, former librarian Fred Friend, SPARC director Heather Joseph, publishing consultant Joseph Esposito, de facto leader of the Open Access movement Peter Suber,Open Access Advocacy leader at the Latin American Council on Social Sciences (CLACSO) Dominique Babini, Cameron Neylon, advocacy director for the non-profit OA publisher Public Library of Science, Philippe Terheggen, Managing Director, STM Journals at Elsevier, and Michelle Willmers,Project Manager of the OpenUCT Initiative at the University of Cape Town (UCT) in South Africa.

The full list of those taking part in this Q&A series can be found here.
