The Open Access Interviews

Richard Poynder talks to Leslie Chan, Associate Director of [Bioline International](), co-signatory of the [Budapest Open Access Initiative](), supervisor in the [new media]() and [international studies]() programs at the University of Toronto, and tireless champion for the needs of the developing world.

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Every revolution has its unsung heroes: those people who contribute a great deal to a cause, but who are insufficiently recognised for it — sometimes because their efforts take place behind the scenes, sometimes because they are unduly modest, sometimes for a combination of such reasons.

That would appear to be the role that Leslie Chan has played in the Open Access ([OA]()) movement. Without fanfare, and with little public thanks, Chan has for over ten years now tirelessly promoted OA — travelling the world to give presentations on the topic, writing articles in support of it, and advising, assisting, and motivating others to play their part too, all voluntary work that Chan has had to fit around a full-time teaching post at the [University of Toronto Scarborough]().

Who is Leslie Chan, why is he so committed to OA, and why does he believe it to be so important for the developing world? To answer these questions we need to look more closely not just into Chan's background, but into the development of OA itself.

Leslie Chan

Contents

The beginning

Chan was born in Hong Kong in 1959. His father had fled there from the Chinese coastal city of Swatow ten years earlier, departing just hours before the communists arrived to hang him for being a landowner. Chan's mother and older brother joined Chan senior in Hong Kong a few years later, where Chan and three further siblings were born.

Safe in Hong Kong Chan's father took on a series of odd jobs, and ended up working in a garment factory. In the 1960s, however, he founded his own factory, and went on to become a successful Hong Kong businessman.

As the time approached for Hong Kong to be returned to China, however, Chan's parents began to fret about the future. Repeatedly telling Chan "the communists are coming" they persuaded him to leave the island — and at the age of 16 Chan departed for Canada, to enter high school and then university.

Chan's ambition had been to become a biological researcher. But at university he found himself drawn to anthropology (in which he took his degree), and became a primatologist.

It was in trying to get his first paper published that Chan first suspected that all was not well in the world of scholarly publishing: Although his paper was accepted, he was dismayed to be told that if he wanted to include the photo of a blonde macaque that he had submitted with it he would have to pay $2,000 for the publisher to make up a colour plate. As a graduate student, he simply did not have that kind of money.

This was in 1994, just when the Web was beginning to take off. Convinced that the photo made an important point about hybridisation, Chan suggested to his supervisor that he publish the paper himself on the Internet — a proposal that earned him a stern lecture on the dos and donts of academic publishing.

But Chan could not but be struck at the absurdity of the situation: Researchers around the world were now able to communicate with one another instantly over the Internet and yet, as he put it, "they couldn't use the medium to communicate the results of their research to other researchers, and take advantage of the medium to conduct quality control such as peer review. That seemed kind of silly to me."

At the same time, Chan was frustrated by the difficulties he was experiencing accessing some of the key literature on macaques he needed for his thesis. Many of these papers were published in journals originating from countries like India, China, and Indonesia, but his university library did not subscribe to these journals, even though they were relatively inexpensive. He discovered that this was because many journals from developing countries were not represented by subscription agents, which made it difficult for libraries to subscribe to them.

Additionally, even though these journals were modestly priced, the library budget was so heavily (and disproportionately) tied to big commercial journal packages from Western publishers that there was little money left to subscribe to other sources. It seemed to Chan that knowledge from the developing world was as a result being systematically underrepresented.

Chan's second learning point came while reading 19th Century descriptions of primate behaviour. Intrigued by the divergent ways in which people from different cultural backgrounds had described what was clearly the very same behaviour (a phenomenon he also began to notice in contemporary descriptions) he concluded that our "cultural understanding of knowledge" means that researchers too often talk past each other. This, he felt, was getting in the way of scientific progress.

Here too, thought Chan, the Internet could help: Instead of trying laboriously to describe the complex behaviour of animals in words, researchers could simply place video clips on the Internet, enabling them to share their observations with other researchers in a culturally neutral fashion. Doing so would also have the merit of saving them a lot of time and unnecessary debate about who is seeing what.

Sadly, this too was deemed an unsuitable way of communicating one's research findings — particularly if one was hoping to get tenure or promotion.

Experimental service

As he became more and more fascinated by the potential of the Internet to improve the way in which researchers communicate their findings Chan's research interests began to drift from anthropology to new media studies. Today, he says, "I am interested in the whole issue of how knowledge can be represented in this new medium, and how we can create communities to share knowledge. I am also interested in how we can train the next generation of students to use the medium to greater effect."

One initiative that Chan was especially drawn to was Bioline International. Founded in 1993 by UK microbiologist Barbara Kirsop and her husband Brian, Bioline was an experimental service created to distribute scientific papers online, and was run in partnership with Brazil's biological information service CRIA, which provided the technology infrastructure.

At that time few (if any) scholarly publishers had begun to think about making their journals available on the Internet, so the Kirsops were able to persuade companies like Taylor & Francis, Chapman & Hall and CABI to permit them to scan in journals and make them available online.

Like the revolutionary physics eprint server arXiv (which had been founded three years earlier by Paul Ginsparg), Bioline had begun as an e-mail service, but adapted to each generation of Internet technology as it became available. "When we started there was no Web, no OA movement — basically just email and ftp protocols," says Kirsop.

She adds: "Bioline is a fascinating story, mirroring the development of email, gopher and the WWW etc. I still meet publishers who came to our farmhouse in the early days to view rather dodgy connections to Brazil, and eat apple pie in the kitchen. How we laugh!"

For publishers Bioline was a learning experience that cost them nothing but taught them a great deal; so much in fact that when the Web started to take off they promptly withdrew their content from Bioline and launched their own Internet-based products. As Kirsop puts it, "The commercial publishers eventually realised that they could create their own infrastructure and do it themselves; and that they could make a nice profit in the process".

But the Kirsops had learned a lot too. So instead of shuttering Bioline, they decided to do something more useful with the platform they had created with CRIA. "For us it was an experiment that changed along with the technology," says Kirsop. "We also came to realise how valuable such a model could be for science in the developing world."

So the Kirsops transformed Bioline from an experimental electronic platform for distributing Western science journals into an online hosting service for publishers in the developing world who wanted to make their content more accessible by putting it online.

In short, since most developing country (DC) publishers did not have the necessary resources to put their journals online themselves, the Kirsops would do it for them. In this way, they reasoned, they would make DC research more visible — benefiting not only the publishers, but also their authors, the developing world at large, and global science too.

For Chan Bioline was appealing for two reasons. First, it was a fascinating experiment in the use of the new medium to share knowledge and distribute research findings. Second, its focus on helping the developing world was of personal interest to him. "China is very, very close to home for me, and many people forget that it is a developing country," he explains. "Anyone who has travelled into the interior of China will know how much of the country is desperately poor."

Reflecting on his own childhood, he adds: "We grew up in what you would call a slum in Hong Kong. Really, it was a slum, and there were seven of us living in one small bedroom. I knew what it was like to be very poor as I was growing up."

It wasn't long, therefore, before Chan had become associate director of Bioline. And in 2000 he relocated the service from the UK to the University of Toronto, having persuaded the University to support it until he was able to secure funding elsewhere.

Funding, however, proved elusive. After failing to get a grant from the Canadian government, Chan introduced a pay-per-view system for Bioline. But two years later, after Chan had made just eight sales (at $8 a time), administrators at the University of Toronto pointed out to him that it was costing $5 to process each payment. Since Chan had agreed to pass 90% of all revenue back to the publishers this meant that processing each transaction was costing Bioline roughly five times more than it was earning from the sale.

Chan said to himself: "Wow, in order for people to register and pay we need to maintain all this technology. We then have to process that payment, and we have to keep track of the payments. Then we have to make sure we get receipts."

This was his third learning point. It was also Catch-22 — for Chan realised that even if his pay-per-view arrangement eventually took off, every sale would serve only to increase Bioline's overheads, and so further exacerbate the funding problem he faced.

Once again Chan was struck at the absurdity of the situation: leaving aside the inefficient economics of the ecommerce system he had created, Bioline had achieved the very opposite of its stated objective of making DC research more visible to the world — for by introducing a financial firewall between Bioline papers and potential consumers, Chan had simply locked out potential readers, not increased access.

At the same time he was conscious that while his pay-per-view system had only sold eight papers in two years, those Bioline publishers who had opted out of the payment system — insisting that their journals be made freely available to anyone who wanted to read them — had seen the number of papers downloaded from their journals grow exponentially.

One example of this was the *Journal of Postgraduate Medicine* (JPGM) — A publication of the Staff Society of the GS Medical College and KEM Hospital in Mumbai, India. JPGM had been freely available on Bioline from day one, and in two years the number of hits it had received had grown from 2,635 to 43,392.

JPGM had also seen a steady growth in annual author submissions, which in the first four years had risen from 190 to 629. Significantly, the number of submissions from foreign authors had also risen, from less than 10% to 38% in two years, demonstrating that the journal was increasingly being viewed as an international journal capable of reaching a global audience. This was precisely the outcome that Bioline had hoped to achieve for all the journals it hosted.

Compared with the performance of the pay-per-view journals on Bioline, the JPGM figures were a vivid demonstration of a lesson the Internet has taught many: When content is made available on the Web it can attract a much larger readership than in print, but very few people are prepared to pay for the privilege of reading it online. Consequently, any access barrier introduced is almost invariably counterproductive.

It also occurred to Chan that charging for scholarly articles on the Internet is doubly absurd, since the objective of researchers when publishing their papers is not to earn an income, but to have an impact. In short, the more eyeballs they can attract the better.

Given this, it was by now also evident to Chan that the traditional scholarly publishing system significantly disadvantages researchers in the developing world — for they are far less likely to have their papers accepted by high-prestige, widely-read journals like *Nature* and *Science* than researchers in the developed world. Since these journals are read by a very large number of

eyeballs, Western-based researchers are able to reach a much larger audience, and their research has therefore a much greater impact on science.

This in turn tends to mean that Western-based research is more likely to get further funding and DC research less likely — in a vicious circle that disproportionately benefits researchers in the West, and compounds the so-called 10/90 gap.

The 10/90 gap

The 10/90 gap is the phenomenon in which 90% of the world's R&D money is spent on the 10% of diseases that primarily affect people in developed countries, while only 10% is spent on diseases that mainly affect the 90% of people who live in the developing world. Explains Chan, "[W]e still don't have a good handle on malaria, on sleeping sickness and many other very common diseases that are found in the developing world. And we don't have a good handle on them because there just hasn't been enough R&D money spent on them. They are neglected diseases."

Of course there is more than one reason for this dollar-spend inequity (including the fact that Western-based pharmaceutical companies know they cannot make a large profit from selling drugs to treat diseases primarily affecting poor people), but since much of the research into the neglected diseases is undertaken in developing countries themselves, and the findings published in local journals with limited circulations, the relative invisibility of that research makes it far harder to get funding.

And since research tends to be a cumulative process — in which researchers build on the work of previous research in order to arrive at new understandings, and eventual breakthroughs — the invisibility (and consequent shortfall in funding) of DC research inevitably lengthens the time before cures are developed for the neglected diseases.

Making this point, Chan cites a content-analysis study that a couple of researchers did on *The New England journal of Medicine* a few years ago. This, he says, found that over an eight year period, "less than 3% of the research articles, review articles and editorials published in the journal addressed health issues in the developing world." The researchers concluded, adds Chan, "that this gap in medical publications is even larger than the 10/90 gap."

We should note in passing that the obscurity of DC research has implications for all of us, since many diseases (e.g. cancer and HIV/AIDs) recognise no borders, and plague us all. As such, the obscurity of DC research into such diseases has implications for mankind at large.

Obscurity of their own work aside, researchers in the developing world face a second problem: The bulk of published research is published in Western journals, and in order to access these journals it is necessary to pay subscription fees — fees that few DC research institutions can afford to pay. This puts DC researchers at a further disadvantage when conducting their research — since they are frequently unable to access the findings of others working in their field.

Further compounding the problem, Western journals are the first choice for DC researchers when seeking to get their own papers published. While the odds are stacked against them, some succeed. And when they do, although their research will be more visible to researchers in the West, it will be as good as invisible to their compatriots.

This means that DC researchers find themselves increasingly deprived not just of access to the latest research done in the West, but of the best research produced by their colleagues too. When DC researchers publish in Western journals, says Chan, it amounts to "locally-produced literature ... [going] ... outside the country, leaving it inaccessible to so many other researchers in their country."

As if that were not enough, says Chan, large Western publishers are increasingly buying up small DC publishers, further appropriating local research, and usually destroying local jobs in the process, since the editorial office of the acquired publisher is invariably closed and the work moved abroad.

But what JPGM had demonstrated was that if DC research is made freely available on the Web, its visibility (and therefore also its status) is significantly enhanced. In other words, the Internet allows DC researchers to have much greater clout.

It follows from this, of course, that if research from developed countries were also made freely available on the Web DC researchers would not only achieve greater visibility for their own research, but obtain equality of access to the work of others. As such, the research playing field would be levelled, helping to mitigate the 10/90 gap.

But how to achieve this?

Larger, more generalised crisis

Fortuitously, by the later 1990s it had become apparent that the access problem confronting DC researchers was but a symptom of a larger, more generalised crisis afflicting scholarly communication — one that Chan had had intimations of when trying to get his first paper published. In short, the research community at large was confronted with a growing accessibility problem.

Indeed, as a result of a phenomenon that has been dubbed the scholarly communication crisis even the wealthiest universities in the world were having to cancel journal subscriptions, leading some to conclude that the scholarly communication system created by Henry Oldenburg nearly 350 years ago was in danger of collapsing under its own weight.

When in 1665 Oldenburg had created the first printed scientific journal in the English-speaking world (*The Philosophical Transactions of the Royal Society*) he centralised a process that had until then taken place in what we would today call a peer-to-peer fashion. That is, until then researchers had shared their papers with each by mailing them individually to their colleagues. Oldenburg invited them instead to send their papers to the Royal Society (RS), which had them reviewed by experts in the field (peer review), after which it published them in a print journal that it distributed to everyone. As such the RS became an intermediary — or gatekeeper — in the process of scholarly communication.

And as mankind's scholarly endeavours grew so more and more disciplines emerged, and new learned societies were formed to manage the consequent growth in research papers — a logical way of scaling up.

So why had a system that had served the research community well for 350 years begun to creak at the seams? Because eventually the amount of research being done globally grew to the point where the traditional intermediaries (learned societies and other not-for-profit organisations) were — for a variety of reasons — no longer able to scale up quickly or effectively enough.

Spotting a good business opportunity, commercial publishers moved into the scholarly publishing market. And since commercial organisations always seek to expand their market, they accelerated the process of growth, launching many new journals, and encouraging researchers to publish at a faster rate. This put increasing financial pressure on research institutions, who could no longer afford to pay the constantly growing subscription bill arising from the stream of new journals.

By now it had also become common practice for publishers to insist that, as a condition of publication, author(s) must assign copyright to them, thereby giving publishers ownership of the papers, and so exclusive distribution rights. Since all papers are unique, and researchers need access to everything published in their field, every scholarly journal effectively became a monopoly.

Further compounding the problem, journal subscriptions are funded by the institutional library, not by the researchers themselves. This means that while researchers make the purchasing decision, someone else picks up the bill, causing a disconnect between the seller and the consumer. For this reason the scholarly journal market is not subject to normal market forces, and publishers have generally been able name their own price.

The end result was a rapid increase in the number of journals, and constant and unsustainable price rises, with costs consistently rising much faster than the RPI. In a recent issue of *C&RL News*, for instance, David Lewis reports that the average serial price has over the last thirty years risen more than "six times the rate of general inflation and over two-and-a-half times the rate of increase of the cost of [US] health care."

In the specific case of journals in chemistry and physics, added Lewis, between 1975 and 2005 the average cost of a journal rose from $78.84 to $1,879.56.

In the meantime, library budgets have been static or falling.

Today the annual value of the peer-reviewed journal market is estimated at £25 billion [$50 billion], and consists of 23,700 journals, which between them publish 1.59 million articles a year.

In short, few if any research libraries in the developed world can now afford all the research they need, let alone those in the developing world. That is, they cannot provide their researchers with access to an adequate subset of those 23,700 journals.

It is important to stress again that this is a crisis of degree, and one that disproportionately affects DC researchers. As Chan points out, for instance, where the University of Toronto might be able to afford subscriptions to, say, 2,000 medical journals, the medical school in Nairobi will probably only be able to afford 30 or 40. This is a huge gap in accessibility; and one that puts DC researchers at a significant disadvantage in their research endeavours.

Consider this for instance: Recently *Infochange* reported that the total annual budget for one of the premier scientific institutes in India, the Institute of Mathematical Sciences, Chennai (IMSc), is currently around Rs 13.3 crore, of which Rs 2.55 crore is spent subscribing to academic journals. "Around 55% of this Rs 2.55 crore is paid to the two largest publishing companies — Reed-Elsevier and Springer — for the privilege of receiving a selection of the journals that they publish," said *Infochange*.

In other words, *Infochange* added, "more than 10% of the total budget for IMSc (more than the entire budget for faculty salaries) is paid directly to these two multi-national companies."

We should add that while for the developing world this is a historic problem (and comparable to the problems it faces in providing researchers with labs) for the West it is a relatively new problem — although as we say, one that means even the wealthiest institutions in the world are now struggling to cope.

What we learn from all this is that the scholarly communication system created by Oldenburg is now broken, and the future development of science compromised as a result.

Seeking a solution

As the problem had become increasingly apparent librarians and researchers around the world had launched various initiatives to try and resolve the situation. Bioline was one such initiative; another was The Scholarly Publishing and Academic Resources Coalition (SPARC).

Founded by the American Association of research Libraries (ARL) in 1998, SPARC's initial focus was on creating new low-cost subscription journals, and electronic platforms like BioOne.

In addition, a number of large library consortia were created (including OhioLINK and the Canadian CNSLP) in order to give librarians greater muscle when negotiating institutional subscription contracts with publishers.

But it was not until 2001, when George Soros' Open Society Institute [OSI] organised a meeting in Budapest that a concerted approach was taken.

We should note that OSI's involvement flowed from its belief that developing countries needed help to improve and upgrade their library systems, not from a concern about the scholarly communication crisis. The convenor of the Budapest meeting Melissa Hagemann, for instance, had worked on OSI's Regional Library Programme — created to provide assistance to former Soviet Union countries on a range of library issues, including library automation, preservation and conservation.

In talking to librarians, however, Hagemann was inevitably alerted to other issues, and to the various initiatives that were being launched at grassroots level in the West — including those focused on improving the speed and efficiency of scholarly communication, and those aimed at addressing the serial price inflation problem. As she put it to me in 2005, "Given OSI's long-standing support for libraries and publishing within developing and transition countries, we were quite interested in the development of arXiv, and the response that the Public Library of Science [PLoS] petition generated in 2001."

In other words, in seeking to help improve libraries in the developing world, OSI found itself swept up into a much larger movement — as indeed did Chan, who was invited to Budapest on the strength of his work on Bioline. Others invited included Stevan Harnad, Peter Suber, publisher Jan Velterop, and then SPARC Director Rick Johnson.

In the event, the Budapest meeting was a huge success. Indeed in retrospect we can see it to have been a seminal event, leading as it did to the launch of the Budapest Open Access Initiative (BOAI), and to the creation of the Open Access Movement itself.

As Chan points out, prior to BOAI there had been various initiatives looking at different parts of the scholarly communication crisis, but no comprehensive approach. After BOAI, there was a single (although somewhat argumentative) movement focused on all aspects of the problem.

So what strategy was agreed in Budapest? Those attending the meeting all agreed (as had Kirsop, Chan and Ginsparg a few years earlier) that the obvious solution was to exploit the Internet. But how?

After all, publishers had by now made a lot of their content available on the Web. Elsevier, for instance, had launched its ScienceDirect platform in 1997, and competitors had soon followed suit.

But despite this, serial price inflation had only intensified. It had also led to growing consolidation in the industry, as publishers rushed to create all-you-can-eat subscription packages (the so-called "Big Deal"). This allowed publishers to say to librarians, "Look you can get all the journals you subscribe to through a single online interface now, why not let us throw in a few more journals at a discount". Most in any case insisted that libraries subscribe to large portfolios of journals, rather than individual titles, further increasing the cost burden and locking libraries into a fewer and fewer number of large journal packages from a handful of companies.

And as the big publishers got larger and larger so they absorbed more and more of any library's budget, and so were able to elbow smaller publishers out of the market, increasing their monopoly power, and constantly raising their prices in the process.

As it became increasingly apparent that poorer nations were now effectively locked out of the scholarly journal market, a number of special packages were put together. In the same year as BOAI, for instance, the World Health Organisation (WHO) persuaded a number of scholarly publishers to provide free or discounted access to medical journals for researchers working in developing countries — the so-called HINARI package. Two years later the Food and Agricultural Organisation (FAO) negotiated a similar package (AGORA) of free or discounted journals covering agricultural, food and nutrition research.

But these arrangements have been increasingly criticised — not least by Chan — on the grounds that, at best, they create an unhealthy dependency on "information philanthropy" and, at worst, they have simply become vehicles for helping publishers test markets under the cynical pretext of providing charity.

It was clear to those attending the Budapest meeting, therefore, that electronic distribution alone would not solve the accessibility problem. Consequently, they adopted a dual strategy. BOAI-1 (Green OA) was intended to encourage researchers to self-archive copies of all the papers they published on the Web, either in a central archive like arXiv or in an institutional repository (IR). The aim was for authors to ensure that a "supplemental" copy of their papers was always freely available online for anyone whose institution could not afford to buy access to the publisher's official version.

BOAI-2 (Gold OA), meanwhile, aimed to persuade publishers to develop a new type of journal; one that instead of demanding that readers (or their institutions) pay a subscription to access the contents, would charge an upfront "article-processing charge" (APC) or "author-side" fee for publishing a paper. By front-loading their fees in this way, publishers would be able to make all the papers they published freely available on the Internet themselves, and from the moment of publication. This approach had already been adopted by the first OA publisher Biomed Central (BMC), which had recruited Velterop earlier in 2001.

By adopting this dual strategy BOAI envisaged that researchers wanting to ensure their research was freely available would have a choice: They could find the money to pay an APC, and have the publisher make their paper freely available on the Web for them, or they could continue publishing in subscription-based journals, and then self-archive their papers themselves.

Unsurprisingly, publishers initially bridled at self-archiving. But confronted by an increasingly effective OA movement, and a great deal of moral pressure (since they were making a profit out of public money, and in some cases enjoying a 35% margin), most eventually bowed to the inevitable, and today around 91% of scholarly publishers permit some form of self-archiving, although often only after a six or twelve month embargo.

The promise of OA, then, is that every paper published will eventually be freely available on the Web — either via Gold or Green OA. And since the traditional subscription model most disenfranchises DC researchers, they would appear to have most to gain from OA. Not only does it promise greater visibility for their own work, but if all the research produced in the West becomes freely available too, then DC researchers will enjoy true equality of access — something that the subscription system could never provide.

And as more and more papers have become freely available on the Web a new phenomenon has been noted — the so-called "OA impact advantage". That is, papers made OA are cited more frequently than papers locked behind a financial firewall. This means that OA authors can expect to have greater impact on their subject, and so enjoy better career prospects. Moreover, research suggests that, once again, it is DC researchers who will be the greatest beneficiaries of the OA impact advantage. Implicit in this, of course, is the possibility that OA will also boost research into neglected diseases, and so help the developing world at large.

This then was the goal of the BOAI. So far as Bioline was concerned, Chan's attendance at the Budapest meeting led to an important decision: Publishers were told that from 2004 all the journals on Bioline would have to be made available on an OA basis, and the service has been 100% OA ever since. The impact this has had usage can be gauged from the Bioline statistics published on CRIA's site.

In total, Bioline now hosts 17,490 articles from 76 journals published in a wide range of DCs, including India, Uganda, Ghana, Turkey, Egypt, China, Iran, Venezuela, and Bangladesh. And today around 3.5 million papers are downloaded from the service each year.

The bottom line

We should note, however, that while it cannot be doubted that OA increases both the visibility and the accessibility of research, it is far from clear that either of the BOAI strategies can or will resolve the so-called affordability problem that continues to plague the global research community.

For some OA advocates this is proving a disappointment, since many had assumed that OA would also squeeze costs out of the system. Certainly to date there is no evidence that this is happening, or indeed going to happen. Librarians continue to pay subscriptions to publishers (and will continue to do so if Green OA is to flourish), and Gold OA simply transfers the costs from an institution's library budget to the author of the paper (or more usually to another source of funding within the author's institution, or his funder). Indeed, since Gold costs are now being paid in addition to traditional subscriptions, there has presumably been a step change in the overall costs of scholarly communication in the last year or so.

Certainly Gold OA is particularly problematic for DC researchers, since it means that they face the prospect of simply moving from a situation in which they cannot afford to access all the research they need, to one in which they cannot afford to publish all the papers they produce.

Aware of this, most OA publishers have introduced schemes to allow researchers without the necessary funds to request that their APC is waived, or discounted. However, not everyone is convinced that this offers a long-term solution. In a letter published in *Nature* last month, for instance, Raghavendra Gadagkar, a professor in the Centre for Ecological Sciences, at the Indian Institute of Science in Bangalore argued that while page charges may be waived for authors who cannot afford to pay, "a model that depends on payment by authors can afford only a few such waivers."

For that reason, he warned, OA "could be disastrous for the underdeveloped world... [since it would encourage] ...people to remain as consumers (readers), rather than to become producers (authors) of knowledge."

DC researchers, he added, will inevitably prefer a "publish for free and pay to read" model over a "pay to publish and read for free" model. The fact is, he concluded, "If I must choose between publishing and reading, I would choose to publish. Who would not?"

Open Access advocates were quick to point out that BOAI's dual strategy means that it is not accurate to argue that DC researchers face such a stark choice, since they can continue to submit their papers to "publish for free" subscription journals, and then self-archive them using the Green OA strategy.

The problem with this, however, is that researchers have shown themselves to be extremely reluctant to self-archive, and today only 15% of authors do so spontaneously. And while OA advocates have persuaded some research funders and institutions to insist that researchers self-archive, there are today still only 44 self-archiving mandates in place worldwide, most of them in the developed world. Moreover, point out critics of Green OA, self-archiving will eventually lead librarians to cancel journal subscriptions, causing the eventual failure of the journals on which self-archiving depends.

Other OA advocates insist that any concern about APCs is misplaced since, as Peter Suber puts it, "the majority of OA journals don't charge any author-side fees, and for the minority that do, the fees are usually paid by sponsors or waived."

The former point is one that Suber makes frequently. And in doing so he invariably cites a number of studies — including a 2005 report commissioned by the Association of Learned and Professional Society Publishers (ALPSP), a study Suber undertook himself last year with Caroline Sutton, and a self-described late night "hack" by OA advocate Bill Hooker, all of which studies indicate that the majority of OA journals do not charge author-side fees.

This line of argument, however, evades the underlying issue. That is, even if the majority of OA journals do not currently charge APCs it does not mean that the costs of publishing have gone away, simply that they are being allocated elsewhere. Importantly, it does not mean that publishers won't introduce a fee at some point in the future, since some publishers are treating Gold OA as a loss-leader. (A fact implicit in the decision by the American Physical Society to under price its Free to Read OA option to encourage take-up, as APS treasurer/publisher Joe Serene conceded to me recently).

Likewise, just because Gold OA publishers offer a waiver today does not mean that they will continue to offer one, or will not start to ration waivers, which is precisely what BMC was accused of doing in 2006.

We should also note that while most traditional subscription publishers now offer "hybrid" OA options like Free to Read (where the journal will allow authors to choose to publish for free and allow their paper to go behind a firewall or to opt to pay an APC to ensure their paper is made OA), not one of these hybrid journals offers a waiver scheme.

For Bioline the OA affordability problem is real and pressing, if a little different. It also presents Chan with yet another Catch-22: Since publishers pay him nothing towards the cost of hosting their content on the service, every new journal added to Bioline further increases his overheads, without making any contribution towards costs. As a consequence, Chan has not been able to expand the service to help the many other DC publishers and researchers who would wish to benefit from OA.

True, in 2004 OSI provided a $30,000 grant to enable Chan to add 10 new journals to Bioline. But as a one-off contribution this was just a drop in the ocean, and has left hundreds of other DC journals unable to join Bioline.

To add to the pressure on Chan last year the University of Toronto informed him that it intends to discontinue funding Bioline in the near future. Consequently, not only is he unable to add further journals to its service, but unless Chan can resolve his funding problem soon the service itself may not survive.

His priority, therefore, has been to reduce costs as much as possible. And Chan has had some success in this. By persuading the journals he hosts to provide their papers in electronic format, for instance, he has reduced costs considerably, since scanning papers in from a print journal is very labour-intensive. In addition, much of the work is now done by student volunteers.

Nevertheless, there are still costs. As Chan puts it, "the bottom line is that it takes money to sustain Bioline". More specifically, it costs $80,000 to run the operation in Toronto, and another $35,000 to maintain the technology infrastructure at CRIA. And if it is to grow, and take on the many other DC journals clamouring to join, Bioline will clearly need a larger budget going forward.

So while Chan has demonstrated that OA can significantly increase the visibility (and credibility) of DC research, Bioline remains entirely dependent on the goodwill of the University of Toronto. And with no revenue coming in, and the University due any day to pull the plug, the service is in a very precarious situation.

In short, Bioline has no sustainable "business model". Moreover, Chan has neither time nor expertise to develop one. As he puts it, "We are on a life support system so it is hard for us to think big, and develop grand marketing ideas and business models."

Once again, Bioline's predicament is symptomatic of a problem that confronts the entire Open Access movement: For while few now doubt that Open Access is inevitable, no one has yet devised a convincing model for funding it over the long-term.

True, BMC is expected to break even this year, and the Cairo-based Hindawi is said to have successfully transformed itself from a subscription-based publisher to a 100% OA publisher, and yet still make a profit. Nevertheless from the perspective of the research community — rather than the commercial publishers feeding off it — many questions remain as to the long-term viability of OA, not least because there is no evidence that it will ever reduce the costs of disseminating research. As we saw, this is a particular concern for DC researchers, but one for the research community at large too.

Chan himself is by no means ready to give up, and has recently turned to SPARC for advice. In response, SPARC has tasked its senior consultant Raym Crow to advise him. "I'm confident that Leslie's commitment to Bioline's success will ensure the initiative's transition to a funding model

that relies on earned revenue models (including, potentially, voluntary access fees and a sponsorship program) to supplement a reduced subsidy from Toronto," Crow e-mailed me recently.

He added, "Leslie has been remarkably successful in persuading the University of Toronto to subsidise much of Bioline's operating costs for the past six or seven years through cash subventions and in-kind subsidies, but the most stable funding models for Open Access initiatives will target the audiences that benefit most directly from them."

What will this mean in practice? That is not yet clear, but one strategy being considering is to approach those institutions whose researchers most frequently download material from Bioline and ask them to make an annual contribution — a model not unlike the institutional membership scheme introduced by OA publishers like BMC.

Another possibility might be for Bioline to rebrand itself. Today we are witnessing a rapid growth in the number of institutional repositories, but as director of publishing and strategic initiatives at the University of California Catherine Candee pointed out to me in 2006, not all research institutions will want to create their own institutional repository. They may, however, want to join a consortium. As she put it, "I doubt every single school will have its own institutional repository. More likely their content will be hosted by the larger schools like ours."

Meanwhile subject-based repositories like arXiv, RePEc, and PubMed Central continue to develop and flourish. Within this mix it would seem logical for a service like Bioline to position itself as a geographically-based repository. In other words — in addition to hosting papers on behalf of the 76 DC publishers it currently has a relationship with — it could invite DC researchers to deposit their papers in Bioline, regardless of where they had published them.

In fact, Chan has previously tried something similar, at one time inviting Bioline publishers and external researchers to post additional material into an experimental archive he created at the University of Toronto. But that was some years ago, when OA had a far lower profile. Moreover, Bioline would be a much more natural and obvious place for DC researchers to self-archive their papers than a small experimental repository without credentials.

Chan could then approach organisations like WHO and FAO and suggest that rather than continuing to prop up a small group of commercial publishers clinging to yesterday's publishing model through initiatives like HINARI and AGORA, they would be better supporting a next-generation non-profit service like Bioline. They could also do a little more to promote Open Access — both the Green and Gold varieties — at the same time.

What should not be doubted is that the traditional system of scholarly publishing has hit a brick wall, and the problems faced by Bioline are symptomatic of that crash. Consequently, the research community is either going to have to bite the bullet in order to continue funding scholarly communication, or be prepared to undergo a far more root and branch reform of the system that it has inherited from Oldenburg than was envisaged at Budapest.

However, this is not an issue that the research community can decide on its own. Society at large will either need to find the necessary funds to make Gold OA possible, or the system created 350 years ago will need to be reengineered in a far more radical way — by, for instance, undertaking a radical re-appraisal of the way in which peer review is done. After all, peer review is the real bottleneck in the system.

But that's a discussion for another day. Let's finish with an assessment of Chan's personal contribution to the OA movement.

Harmony and cohesion

Chan could not (and would not) claim to be one of the OA movement's "thought leaders" — in the way, for instance, that someone like Steven Harnad or Peter Suber might. Nevertheless, he has played an invaluable role; one, moreover, that — since he primarily works "off stage" — has not always been apparent to the movement at large. Chan's low visibility can also no doubt be

attributed to the fact that most of his energies have been focused on advocating for OA in the developing world.

But Chan has proved himself to be no mere foot soldier in the battle for OA, content to follow others and toe the line. The very fact that he insists on placing the stress on the developing world is a demonstration of this. After all, the movement has primarily focused on the needs of Western science, and many OA advocates express impatience when asked to take account of the specific needs of the developing world. Chan, by contrast, has consistently and persistently argued that OA has to be viewed as a tool for levelling the playing field in global science, as much as a mechanism for improving scholarly communication.

As fellow OA advocate Jean-Claude Guédon puts it, "Leslie has played an important role in insisting that the OA movement not limit itself to core, elite, Western-led science. He sees OA also (not exclusively, but also) as a way to help developing or emergent economies develop meaningful scientific capacity."

Of course, Chan is not the *only* person to view OA through the lens of the developing world. As Harnad point outs, "Along with Subbiah Arunachalam, Hélio Kuramoto and Sely Costa, Leslie is among the subset of OA advocates whose focus is not only on developing country access and impact (as Barbara Kirsop's likewise is), but who themselves originate from developing countries".

But what is distinctive about Chan is his willingness to roll up his sleeves and contribute in very practical ways, not only in his capacity as associate director of Bioline, but by constantly travelling around the world advocating for OA, often with considerable success.

For instance, says Arunachalam, Chan's advocacy work in India a few years ago inspired Dr D K Sahu of MedKnow Publications to launch 50 local OA journals, and several Indian librarians to create institutional repositories, including repositories at key Indian research institutions like the National Information Centre in New Delhi, the National Institute of Technology, Rourkela and the National Chemical Laboratory, Pune.

Again, this was done without any form of self-publicity, and often unbeknownst to the movement at large.

Chan is also notable (in a movement not short of grumps) for his user-friendliness. As fellow OA advocate Alma Swan puts it, "Leslie is one of the world's nicest people, with a 'do good' gene being expressed in every cell of his body." She adds, "He is very good at making connections, persuading people and influencing things in general."

A good example of Chan's persuasiveness was the role he played in getting Canada's International Development Research Centre (IDRC) to adopt an Open Access policy. Arunachalam had been trying to persuade IDRC vice president Rohinton Medhora to embrace OA for some time, with little success. Then one day Chan turned up and, as Arunachalam puts it, "clinched the deal".

Another Chan quality is his inclusiveness. This was personally evident to me when he summarily rejected my claim that the movement is bedevilled with warring factions — evidenced I suggested by the frequent arguments over the respective merits of Green OA versus Gold OA, or the disagreements over the relative importance of price and permission barriers.

"I would say that views within the Open Access movement are both looser and more diverse than might at first appear," he insisted, "and have always been. Moreover, they change over time."

In any case, he said, differences of opinion are important, as are a diversity of approaches and constant experimentation. The model he constantly invokes is that of evolution. As he put it to me, "What evolution tells us is that you are more likely to find success if you try three, four, or maybe five models than if you just try one. The more diverse ways we can develop to achieve the same end goal the better."

In short, the greater the number of experiments, the greater the chance of success, "because some of them are going to win out; or it may be a combination of them."

The point about Chan adds Guédon, is that "While strongly committed to the principles of OA, he is a pragmatist and can move tactically without insisting on the larger picture. Gradualism, small steps, etc., are acceptable as long as they move in the right direction."

This flexible approach, and his constant amiability, says Guédon, has contributed to the harmony and cohesion of the movement. OA advocate Susanna Mornati agrees. In Chan, she says, the OA movement has found "a fair and loyal spokesman."

If you ask Chan's friends and colleagues to describe his personality you can expect the replies to include words and phrases like energy, humour and generosity of spirit. "I suspect that these traits, coupled with determination and clarity of purpose, have made him especially effective in collaborating with other organisations and in marshalling resources to support and grow Bioline," says Crow.

Unsurprisingly — given his constant peregrinations — most descriptions of Chan are centred around a trip, or often a succession of trips. "Some of my fondest travel stories include Leslie," says Hagemann. "Along the way from Kiev to Vilnius to Beijing to Johannesburg I found Leslie to be an incredibly warm, funny and generous person."

So frequent and varied are Chan's trips, says SPARC executive director Heather Joseph, that before trying to call him she has always first to ask herself: "Now, where is Leslie today? What continent is he on? Who is he working with?"

Chan also invariably insists on organising his fellow travellers on these trips, arranging surprise boat excursions, or simply escorting them to the best location for obtaining a good view of, say, the skyline of Hong Kong.

And Chan makes a point of ensuring that his OA colleagues never feel stranded or alone in a foreign country. "During an OA conference in Hong Kong," says Hagemann, "Leslie invited me to join him and his extended family for dinner. This was the first time in years that he had seen many of his brothers, sisters, nephews and nieces, but he included me in the dinner. And he insisted on organising a day of sightseeing for me the following day."

In short, hearing people talk about Chan's OA advocacy is a little like reading a picaresque novel, or watching a road movie! "I remember him dancing and playing ping pong at a conference", says Mornati. "And he takes thousands of pictures when travelling, so he is our official 'event recorder'."

Lucky Person

To top it all, Chan is modest to a fault. When I emailed him the draft text of the interview he replied, "I feel more than a little embarrassed in reading all those kind and flattering comments from my friends and colleagues. I have mixed feelings about putting them out there, likewise with the family details."

It is also typical that Chan attributes his successes to others rather than himself. "I would say that I am a lucky person," he told me. "I have always had good fortune, and met new people, and very knowledgeable people at that. And I think I have been able to draw a lot of energy and goodwill from these people."

When I asked Chan how old he was he replied, "1959; Year of the Pig". Unfamiliar with the Chinese Zodiac I turned to Wikipedia for enlightenment. "The Pig type," it reads, "is usually an honest, straightforward and patient person. They are a modest, shy character who prefers to work quietly behind the scenes. When others despair, they are often there to offer support". That, I thought, is one in the eye for those who question the accuracy of Wikipedia!"

But what is it that drives Chan? Why devote all his spare time to a cause that has brought him so much frustration and disappointment, and too little recognition? Partly stubbornness perhaps. When I asked Chan how he had kept motivated all these years he replied that it was the laughter that

greeted him when he raised the topic of OA in the early days: the laughter of publishers — who said that he didn't know what he was talking about — and the laughter of senior colleagues, who responded, "You are wasting your time, you are going to kill your own career ... it is just not worth doing."

Indeed, what is most remarkable about Chan, suggests Joseph, is that he has had the inner strength to withstand this laughter, and the many disappointments over Bioline, on his own. As she puts it, "One thing that people don't realise about Leslie, and which is really very impressive, is that while he is a ubiquitous presence at conferences, and at meetings, he doesn't have an organisation like SPARC behind him supporting his OA activities."

What helps, says Chan, is that "I really believe in this stuff." Or as he put it during a recent email discussion I was copied into, "The geneticist Theodosius Dobzhansky famously reminded us that 'Nothing in Biology Makes Sense Except in the Light of Evolution.' I would like to paraphrase Dobzhansky and claim that 'Nothing in Scholarly Communications Makes Sense Except in the Light of Open Access'."

What's at stake if Bioline has to close through lack of funding, and OA fails to deliver the goods for the developing world? We can't say, but consider this: Each year half a billion people are infected with malaria and over a million die as a result. Likewise, there are 300,000-500,000 cases of African trypanosomiasis (sleeping sickness) each year, which the World Health Organisation estimates leads to 66,000 deaths.

If it is true that increasing the visibility of research into diseases can shorten the time it takes to develop cures, then we should surely be doing everything we can to hasten universal OA. And if services like Bioline can play a special role in increasing the visibility of research into neglected diseases, then shouldn't organisations like the WHO and FAO be funding them? After all, if Bioline can help (in however small a way) to save lives, and reduce human misery, wouldn't it be money well spent to fund it?

As Chan points out, if funding agencies like WHO believe in their mission of public education and public health improvement, they should be prepared to support DC journals — even if those journals are unable to develop a self-sustaining "business model". As he puts it, "They need to do so in order to ensure that [these journals] are well read, well circulated and that the research in them is built upon."

And by doing so the funding agencies can benefit too, he adds. "They can say that they are producing results: That they are putting money into these journals ... [and]... as a result, public health is being improved."

The same argument surely applies to funding Bioline?

Meanwhile, our unsung hero continues to circumnavigate the world spreading the word, giving papers and presentations, motivating others to support OA, and all the time racking his brains for a way of guaranteeing a future for Bioline.

And as if that were not enough to fill his days, Chan also finds time to chair The International Conference on Electronic Publishing (ELPUB) and, with OA colleague Swan, he has recently co-founded a new OSI-funded project called OASIS.

"I'm pleased that Leslie's work within the OA movement will be highlighted through this interview," Hagemann told me, "for he toils away behind the scenes and supports so many others through his efforts, yet his own work rarely receives the recognition it deserves."

THE INTERVIEW BEGINS...

RP: Can you start by saying something about yourself and your background?

LC: Sure. I grew up in Hong Kong, where I went through the British education system. Then when I was 16 I came to Canada, where I went to high school and then university.

RP: What year were you born?

LC: 1959; Year of the Pig!

RP: Did you emigrate to Canada with your family?

LC: Well I do have other relatives in Canada, but my immediate family didn't come over with me. They stayed in Hong Kong. However, over time one after another of my family migrated here as well. Meanwhile I had met my wife at University, got married, and ended up staying in Canada.

RP: What university did you attend?

LC: I did my undergraduate and graduate degrees at the University of Toronto.

RP: And what subject did you study?

LC: When I came over I didn't have a very defined idea of what I wanted to study, but I had always wanted to be an academic. More specifically, I wanted to be a researcher in biology.

RP: So you did a degree in biology?

LC: Actually what happened was that as I went through university I became very interested in anthropology. Of course, anthropology has a biological component, physical anthropology in particular, but over time I became more and more interested in human evolution, especially primate evolution. So I ended up doing a degree in anthropology, and my graduate work was in physical anthropology.

Cultural understanding of knowledge

RP: One of your Open Access colleagues, [Barbara Kirsop](#), commented to me: "Leslie studied as a primatologist. Studying apes may have influenced his understanding of the human condition." Given the rich mixture of personalities in the Open Access movement I didn't know whether she was being serious or tongue-in-cheek!

LC: I don't think she was being tongue-in-cheek. Anyway, I did my research in physical anthropology, but discovered that as you study more anthropology you tend to shift your perspective, from studying primates in order to better understand humans — which was always the assumption underlying anthropology, but which turns out to be a false assumption — to studying them for their own sake.

RP: How do you mean false assumptions?

LC: The old assumption was that we should study primates in order to understand ourselves, but it turns out that the more we understand primates the more we realise that we can't really generalise from the primates to humans, because each species has its own evolutionary history, and they are really quite different.

RP: Ok, so that's where you started. Your [web site](#) suggests that your research interests later drifted away from anthropology too. Today you work in social studies, multiethnic studies, multimedia, new media studies, and so on. You have ended up with a rich and varied portfolio!

LC: Yes, and it represents an interesting journey.

RP: Talk me through it?

LC: When I was doing my graduate work in the history of the [Macaque](#) I got very interested in the classification literature. So I had to go back to the early natural history studies published in the 17th and 18th Century — that is, the early descriptions of the Macaque in, for example, East Asia, India and other parts of South Asia. As I read them I became fascinated with these early accounts, and how people had written about natural history, including Darwin of course.

RP: What was it that you found fascinating?

LC: The different way in which people from different traditions would describe what they saw. I noticed differences, for instance, between how the French described natural history and the way that the English did, and of course the way that people from other traditions described natural history.

RP: How do you explain these differences?

LC: What struck me was that while they were supposed to be scientific observations they all strongly reflected the cultural biases of the authors. The descriptions of monkeys that were written by Victorian authors, for instance, were filled with shame, whereas the French were much more liberal in their descriptions, particularly when describing the sexual activity of monkeys.

RP: In reading them, in other words, you discovered as much about the observer as you did about the observed?

LC: Exactly, the whole history of science demonstrates that our observations are never as "objective" as we would like to think they are. So our whole notion of what constitutes scientific knowledge became increasingly interesting to me; that is, our cultural understanding of knowledge, and knowledge representation.

And it was at that point that I became interested in the whole notion of print versus electronic information.

RP: What is the connection between our cultural understanding of knowledge and the issue of print versus electronic information?

LC: Let me explain with an anecdote: When I was writing my thesis I was trying to get my first short paper published, and I wanted to include a colour photo of a blonde Macaque in it. As you may know, Macaques have brownish-grey hair, so a blonde one was a really interesting mutation.

Anyway, I had this really great photo I wanted to include in the paper, but the publisher wanted $2,000 to make a colour plate.

Yes, I'm a blonde. And?

RP: That would have been a lot of money for a grad student?

LC: It certainly was. There was no way I could pay $2,000 to have the paper published. But this was around 1994, just when the Web was to beginning to develop, so I suggested to my supervisor that I put the paper on the Web instead, and let people read it there.

RP: What did you supervisor say?

LC: She said, "Oh, no; you can't do that. You won't get credit for it." And then she read me a whole lecture on what counts and what doesn't count in academia.

RP: So the irony was that while a new electronic medium had become available that would have allowed you to make your paper (plus photo) available to the world for free, you were constrained to use print on paper, and pay $2,000 for the privilege. And presumably access to it would also have been restricted to those researchers whose institution paid a subscription for the journal?

LC: Correct. Suddenly I was able to correspond with colleagues all over the world, and ask for articles and other research materials that I couldn't get from my library. But while scientists all around the world could now talk to each other, they couldn't use the medium to communicate the results of their research to other researchers, and take advantage of the medium to conduct quality control such as peer review. That seemed kind of silly to me.

RP: And one thing that the Web is very good at is communicating visual information?

LC: Yes, and the part of this is that visual information can convey things that cannot be conveyed in print easily, or inexpensively.

RP: A picture is worth a thousand words!

LC: And that's the point: As I began to look at the macaque's sexual behaviour I realised that textual descriptions often just can't do them justice. Trying to describe a monkey's actual behaviour in text loses everything. So that led me to think: "Suppose instead of struggling to explain it accurately in print, I could show a video clip for two minutes?" Not only would it save me time trying to describe the behaviour accurately, but everybody would immediately understand exactly what I meant.

New media studies

RP: Does this go to the point you made about the different ways in which cultures represent knowledge?

LC: Yes. In fact, there was an interesting study done by another primatologist in which he looked at the literature, and demonstrated how — because different people described the same activity differently — everybody had thought that they were describing different behaviours where in fact they were describing the same behaviour.

RP: Presumably people also interpret visual information in cultural terms.

LC: Sure, but the point here is that the way that the texts are interpreted is highly dependent on the cultural background of the scientist. For instance, we have today a lot of Japanese scientists who write about the Japanese macaque, and even though they are looking at the same behaviour their descriptions are very different to those from other cultures.

People think that they are talking about different things because the verbal descriptions don't always do justice to the behaviour itself. If instead we could show a video then we would all essentially be on the same page: We could know whether we are talking about the same thing, or not the same thing.

The problem we still have is that we are stuck with print, and this leads to all kinds of confusions in the literature about what is often very basic behaviour. We are talking past each other.

RP: And this is what led you to new media studies I guess?

LC: Correct.

RP: Is that how you spend most of your time today?

LC: Most of my time yes. I am interested in the whole issue of how knowledge can be represented in this new medium, and how we can create communities to share knowledge. I am also interested in how we can train the next generation of students to use the medium to greater effect.

RP: You were associated with something called the Centre for Instructional Technology Development. That was focused on finding new ways of sharing knowledge was it?

LC: Yes, and it was an interesting experience. The Centre was started in the mid 90s by a colleague with a technical background, and I joined him as an academic staff. The idea was that the library wanted to explore, or invest a little bit, in how digital technology is having an impact on libraries and their services. Essentially they wanted to study not just how people use and consume digital information, but how scholars could create their own intellectual outputs within the university.

So the aim was to support faculty members who wanted to experiment with new media publishing and different kinds of teaching pedagogies, creating their own teaching resources for instance.

RP: What kind of experiments took place?

LC: The creation of learning games, for instance. One of the earliest things we did in anthropology was to create an online skeleton. This allowed students to go into an online environment and explore the human skeleton, bone by bone.

The benefit was that they have to learn all this stuff in the first year in the lab anyway; but we have hundreds of students so there aren't enough real skeletons to go around. What we created, therefore, was a very good way of providing students with digital materials that would help them study for certain courses. The Centre was filled with that kind of thing — practical tools that allowed room for experimentation.

RP: The Centre no long exists right?

LC: Yes unfortunately it was closed. And that was a good example of university politics, and the kind of changes that take place when administrations change. People come in with different interests and projects come and go. The principal at the time had been very supportive of the Centre, but when the next principal came he didn't see it as an academic priority so funding was stopped.

The developing world

Open Access Workshop, MS Swaminathan Research Foundation, Chennai. 2004

RP: Another area that you have always taken an interest in is the problem faced by researchers in developing countries in trying to get access to research information. What is the nature of the problem here?

LC: The problem is both simple and complex. The simple reality is that the cost of access to scientific journals is very high. In fact it is now too high even for western institutions, so for those in the developing world it is simply impossible to afford a subscription to most scientific journals, even at a discounted rate.

So we have a situation in which many, many institutions in the South cannot provide their faculty with the research they need to do their jobs. Even some large medical schools cannot do this. For example, the medical school in Nairobi will have subscriptions to perhaps 30 to 40 medical journals.

Here at the University of Toronto, by contrast, medical researchers we will access to 2,000 to 3,000 medical journals.

RP: Is this just about the cost of journal subscriptions?

LC: No, it isn't. There's also the problem of electronic access. In many parts of the developing world, for instance, Internet speeds are much slower than in the West. And for some getting access to the Internet at all is just not possible.

RP: So even if they could afford the journal subscriptions they might not be able to access them online — which is how most researchers now access papers right?

LC: Yes. To give you an example: nine years ago, during a visit to Brazil, I got talking to one of the editors of *Science* magazine. This editor was boasting, saying how *Science* gives Brazilian institutions a huge discount, and in many cases totally free access. So I asked him to show me the logon process. We were in a hotel, and he dialled up the service in order to download one of these free articles, which was in a PDF file.

He logged on and began to download the file. We waited 25 minutes while he pulled down this one small article, for which the connection was $35. Then I turned to him and said, "Great, it's cost me $35 to get a free article."

RP: So I guess you have views on the schemes funded by organisations like the World Health Organisation [WHO] and the Food and Agriculture Organisation [FAO] that provide researchers in developing countries with free or low-cost access to online scholarly journals — initiatives like HINARI, OARE and AGORA?

LC: Cost of access is just one of the reservations I have about these sorts of initiatives.

RP: What other reservations do you have?

LC: I also have reservations about the content itself for instance. You have perhaps heard about the phenomenon we call the 10/90 gap?

RP: This refers to the fact that 90% of global health research spending is used to address only 10% of the global disease burden. Essentially, it is an issue of how we prioritise spending on health research?

LC: Yes, it's a well known phenomenon: 90% of R&D money is spent on those 10% of diseases that mainly affect a small proportion of the world's population, mostly in the developed countries — things like heart disease. By contrast only 10% of R&D money is spent on diseases that affect 90% of people — mainly those in the developing world.

So, for instance, we still don't have a good handle on malaria, on sleeping sickness and many other very common diseases that are found in the developing world. And we don't have a good handle on them because there just hasn't been enough R&D money spent on them. They are neglected diseases.

RP: One reason for this is that pharmaceutical companies aren't very interested in these diseases since the people most affected by them don't have a lot of money, and so there isn't much in the way of profit to be made?

LC: Yea, and so there you have the 10/90 gap. This also means that if you look at all the major medical journals you will find that there is very, very little content in them that is directly relevant to developing countries. A couple of researchers conducted a [content analysis](#) of *The New England journal of Medicine*, for instance, and found that over an 8 year period, less than 3% of the research articles, review articles and editorials published in the journal addressed health issues in the developing world. The researchers concluded that this gap in medical publications is even larger than the 10/90 gap.

RP: So even if researchers in the developing world are given free access to these journals, and even if they have fast Internet access, it turns out that the content isn't always especially relevant to them?

LC: I'll give you an example. I once asked a colleague who works in surgery in the developing world how useful surgical journals from the North were to him. He replied that all the free journal content is no help at all. The papers talk about fantastic new techniques, but he doesn't even have access to basic anaesthetics. They just don't have the medical infrastructure to provide a lot of medical care.

So most of the medical journals they are given free access to are irrelevant. But for publishers like Elsevier, however, it means that they can boast that they are giving free access to 1,000s of journals.

When I hear them say things like that I always ask them, "But of these 1,000 journals what percentage of the content would be relevant to health researchers in developing countries?"

RP: I understand that the qualification requirements are also controversial. To qualify for these programs, for instance, countries have to be below a certain GDP level, but some argue that this is too blunt an instrument.

LC: That's true. These schemes offer free access to countries with a GDP level of $1,000 or below. There is also a problem in the way that they are administered.

RP: How do you mean?

LC: If, let's say, you live in Zambia — which qualifies for free access — then the University of Zambia will have access to HINARI, but it will be the library that has to administer it. This means that when a user wants to access content from HINARI they have to get a password from the librarian, and then go to a specified terminal. That means that if you are a researcher at a university and you want to access HINARI you have to physically walk to the library, get a password, and then log on at a specific machine.

RP: Another complaint I have heard is that some of the journals that used to be available in these schemes have started to disappear. Is that correct?

LC: It is. This was [discovered](#) by a group of Peruvian researchers, who noticed that when a journal included in HINARI begins to be accessed a lot in a certain part of the world it is pulled from the list for that country.[1]

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[1] The study by Javier Villafuerte-Gálvez, Walter H Curioso, and Oscar Gayoso found that, in April 2007, of the 150 journals with the highest impact factors on the Science Citation Index available through HINARI, the top five could no longer be accessed. A total of 57% of all journals on offer were similarly inaccessible, although all were accessible in 2003. In the main, the remaining 43% accessible journals were already OA or 'free' to low-

RP: Perhaps the real problem with these schemes is that they offer a Bandaid solution to a problem requiring much more serious treatment. I came across a [PowerPoint](#) of yours on the Web in which you argued that these schemes create a "perpetual cycle of poverty and dependence". Your point perhaps was that programmes like HINARI are similar to development programs that hand out food to developing countries, but fail to help them create the capacity to grow their own. The problem is that the more people depend on handouts, the less likely they are to be able to help themselves?

LC: That is precisely what we have been arguing. And it is why I think HINARI-type programs are not enough. We need to learn from history. And the history of other development programs shows over and over again that if you treat these kind of processes as charities that give people what you think they need you are not going to allow them to build any capacity, and you are not going to create any long-term sustainability — because the minute you leave, or stop the supply, people are back to square one, or often even worse off than they were before.

From a development standpoint we know that this approach just doesn't work: you can't just dump aid on people. HINARI people call this "information philanthropy", and that term tells us exactly why it is wrong. It should be a capacity-building process, not a philanthropic process.

RP: In one of the [papers](#) that you have authored with Barbara Kirsop and [Subbiah Arunachalam](#), you contrast Open Access with what you called Donor Access (which is essentially the approach taken by initiatives like HINARI), and you said, "It is a matter of concern that as developing country economies grow, an increasing number of low-income countries will become disenfranchised from such programmes as publishers protect their markets. It is an anomaly that the very success of the UN programmes may lead to their reduction. If the UN programmes should cease, users are left with limited resources, since unrestricted down-loading is not permitted and researchers are unable to develop their own 'reference libraries' of relevant material. Donations may leave users dependent on the goodwill of the donors and limit their ability to build locally relevant research collections and so strengthen their institutional research capacity." That's it in a nutshell I guess.

LC: Right. As I say, one of the key points here is that for the last 30 or 40 years we have seen a certain development approach adopted when helping developing countries. A lot of this development was based on the idea that if you give a developing country aid, then you have done your duty as a rich country. There is this mentality that you give them food, you give them computers, you give them this and you give them that, and they should then just go off and do things with them.

But we've seen that this doesn't work. We have learned that you need to help them build capacity.

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income countries. It is not made clear whether there had been technical problems causing access difficulties, or whether the journals had been withdrawn from the programme."

Bioline International

RP: Let's move on to [Bioline](#). Bioline was founded by [Barbara Kirsop](#) and her husband in 1993, and you joined in 2000. Is that correct?

Brian and Barbara Kirsop, Trustees of Electronic Publishing Trust for Development and founding members of Bioline

LC: Actually I joined in 1998. It was in 2000 that we moved the operation to the University of Toronto.

RP: And so at that point you took responsibility for Bioline. What is your official title?

LC: When it moved to Toronto I became the associate director of Bioline.

RP: That is still your title?

LC: Yes, but we are currently reformulating the structure. Once the new structure is approved I will become the director of Bioline.

RP: Talk me through the history of Bioline?

LC: Sure. As you said, it was an initiative started by Barbara and Brian Kirsop. They are both microbiologists and so like me in the early days of the Internet they found themselves increasingly sending emails back and forth with their colleagues, many of whom were in the developing part of the world, and most of whom had real problems — both in terms of accessing literature from the developed world and communicating their work to the rest of the world.

So they thought, why not have the articles converted into electronic texts and distributed by e-mail, which they began doing. Later, when gopher came along, they began using gopher, and later still they shifted to the Web.

RP: To me this is reminiscent of the way that [Paul Ginsparg's](#) physics server [arXiv](#) began. As I understand it, physicists began sharing their papers by e-mail very early on. However, as early e-mail systems had very limited storage capabilities having files attached to messages meant that the physicists rapidly ran out of storage space. Moving to a central server solved the problem. But tell me, who does all the technology work for Bioline?

LC: It is all done in Brazil. One of Barbara's colleagues is [Vanderlei Canhos](#), and Vanderlei's organisation in Brazil is very savvy with technology. When Barbara explained the problem Vanderlei immediately saw that electronic distribution makes a lot of sense. So he volunteered his crew, and his organisation has provided the technology support ever since. This allowed Barbara and Brian to acquire journal content and convert it into electronic form, and then [ftp](#) it over to Brazil.

RP: What is Vanderlei Canhos' organisation called?

LC: At the time it was called BDT [Base de Dados Tropical], but at some point they changed their name to CRIA. Essentially it is a biological information service based in Campinas.

The team at CRIA, Brazil. On the far left is Sidnei de Sousa (Technical Director), next to him is Dora Canhos and next to Dora is Vanderlei Canhos, both Directors of CRIA

RP: CRIA provides the entire technical infrastructure then?

LC: Correct, so when you log on to Bioline you will notice that the URL ends in .br. In other words, it takes you to the server in CRIA, in Brazil.

So CRIA hosts the database. It also designed the database and the interface and the metadata structure for the abstracts and the full text. So they us the specs and we make sure that our papers all meet those specs so that the CRIA database can effectively index and retrieve the documents.

RP: As I understand it the original aim of Bioline was to allow users in the South to access journal content produced and published in the North (that is, the flow was from the developed world to the developing world). I believe this was later reversed, and the flow now mainly goes the other way, since Bioline's mission today is to put content from journals based in the South on the Web?

LC: Yes.

RP: How did that change come about?

LC: The point is that in the early, early days of the Web nobody really knew what the implications of the new medium would turn out to be. So when Barbara and Vanderlei started they simply wanted to use the Internet as a platform for distributing electronic journals.

RP: You mean it wasn't viewed as a North/South issue?

LC: No. They weren't thinking about it in that context. It was more a case of seeing what journal content was available and who was willing to participate in experimenting with electronic access.

Naturally, some of Barbara's colleagues in the developing countries immediately saw that it made perfect sense for them, and wanted to be involved, and some commercial publishers based in the North liked the idea of experimenting too.

RP: Which publishers?

LC: One of the earliest publishers Barbara worked with was UK-based Carfax.

RP: Carfax was later bought by Taylor & Francis.

LC: I think so, but Taylor & Francis were involved in their own right; as were CABI, Chapman and Hall, Science & Technology Letters, and White Horse Press.

RP: So the initial idea was simply to get a few publishers interested in experimenting with electronic delivery, to make some of their content available online?

LC: Yes. But I don't think they saw much future in it. I remember Barbara telling me that when she talked to people from Carfax they said, "This is never going to work; it's just a passing fancy"!

RP: They weren't interested in experimenting themselves then presumably?

LC: I guess not. This was around 1993, and at that time they didn't have any servers they could use, or anything like that. So they just said, "Sure, take some of these journal titles and put them online. Have fun!"

RP: That's a point. Elsevier didn't even develop ScienceDirect until 1997, and launched with 1,200 journals.

LC: Exactly, this kind of thing wasn't even on the radar screen of commercial publishers at the time. So it was well before publishers developed online services themselves.

RP: Ok, so at first the aim was simply to provide electronic access to scholarly papers. That later changed, and today Bioline provides an electronic platform exclusively for publishers based in the developing wanting to distribute their journals online?

LC: Correct, the service has evolved over time. In fact, there wasn't really a clear mandate at the beginning. But as we approached the late 1990s we saw the growing access problems and we realised that we would be missing an opportunity if we didn't use the Bioline platform to assist our colleagues in the developing world.

RP: Assist them to make their research more visible?

LC: Right, because while they produce their own scholarly journals, for a number of reasons these journals are not widely read, not least because they are not easily accessible. And they can't make them more accessible because they don't have the technology to put the content online. So it made sense to us to provide the platform to allow them to do this.

RP: We are talking about publishers who have a print journal, or a number of journals, but who have insufficient resources to make them available online themselves?

LC: Correct. I should add that we didn't have any preconceived ideas. We just thought we should make them openly available and see if people were interested in reading them. If people were interested then the papers would get more citations, and that would lead to more international collaboration and a greater sense of the value of the science that is being produced in the developing world. As you say, we hoped that it would make developing country research more visible.

RP: How do you choose which journals to assist?

LC: Well, we don't advertise the Bioline service widely. We never have, because we have a very limited operation. The way that we have taken on new publishers in the past has been primarily by

word of mouth, although we did also identify certain promising journals and approached them. And sometimes we had people recommend journals to us.

So for example, the WHO might come to us and say that they are funding a very good health science journal in Tanzania, but it is not online. Would we be able to assist them. In other cases we have ourselves gone out and solicited journals. We might see, say, a journal that is doing quite well locally and ask them to work with us too. We tell them that we can provide a free platform to enable them to make their content accessible online.

RP: The promise here is that in doing so they can get a much wider audience?

LC: Exactly. But I should also stress that we are not a publishing business. These journals all have their own print subscriptions and they already have their own editorial structure. So they produce their own issues and volumes published in print; we just put it online for them.

RP: These are all peer-reviewed journals?

LC: It is one of our requirements that the journals we take on have to have an editorial board and all the articles they publish have to have gone through peer review. Essentially, all we do is take the papers they have published and put them online.

RP: How do they deliver the content to you?

LC: In the early days the journals mostly arrived in print form. We then had to scan them in, OCR them, and reformat them. Then we corrected any errors that emerged during the process.

RP: A pretty labour intensive process then?

LC: It was extremely labour intensive and so very time consuming. It was also prone to errors.

But as we work with publishers over time they become more and more technology savvy, and at some stage we are able to point out that since they edit the papers on a computer, and so already have them in word-processed form, they could just send us the word-processed file?

Once they agree we set up an ftp server for them, at which point they usually ask what an ftp server is — so then we teach them how to ftp. We use an Open Source software package called Plone for this purpose.

RP: So it's an ongoing process of education.

LC: Sure, they have to have access to the basic technology, but we can teach them the knowhow to log on to a computer remotely and transfer files. They can then directly upload their word document to the ftp account we set up for them. Once they've done that we can take those documents and convert them into a standardised format, and then put them into our database ready for the public to access.

This means that over time we go from scanning in the printed pages to having publishers deliver them directly to us online. We find that most publishers learn very quickly.

RP: Do you still do some scanning?

LC: We still scan one or two journals yes. For instance, we sometimes scan in the *East and Central African Journal of Surgery*. This is because the editor has outsourced the typesetting to a third party and doesn't always get the files sent back to him. Or sometimes his electronic copies are incomplete, and don't correspond after the typesetting. When that happens he just sends us the print copy.

The cost of access

RP: When you moved the management of Bioline to Canada in 2000 the University of Toronto agreed to support it financially did it?

LC: Yes. And the logical thing was to incorporate it into the library, so we went straight to the chief librarian and asked for her support. She was immediately interested in, as she saw it as a really nice experiment in electronic publishing.

RP: So what happened?

LC: This is the part where it gets really interesting, and complicated. Initially the library director said we should find a way to make Bioline sustainable. And her first thought was that we should sell subscriptions, or licences.

RP: As in site licences?

LC: Yes. At that time in both Europe and North America there were a lot of library consortia being developed to buy book and journal licences. And as you may know, there was a project funded by the federal government in Canada called the Canadian National Site Licensing Project, or CNSLP.

RP: How did that work?

LC: Essentially, the federal government gave the library community a pot of money to form a national consortium that could go out and negotiate a huge national group discount with big publishers like Elsevier or Blackwell Publishing.

RP: This was one of the early responses to the serials crisis: libraries banded together in order to try and reduce the escalating costs they were having to pay to get electronic access to journals.

LC: And being in a consortium meant that participating libraries could get access to electronic databases that they might not otherwise have been able to afford.

As I say, the initial thought of the people who advised us on the development of Bioline was to try and work out one of these site licensing deals and bid for support from CNSLP. Then if CNSLP gave us a sum of licensing money we could use that money to support the running of the operation.

RP: Which would mean that the library wouldn't have to take on the full cost of supporting Bioline?

LC: Right. So our goal was to develop some kind of "business model" that would make it workable. Essentially although our library was using the content in Bioline, it didn't want to be the only institution supporting it financially. We wanted to find a model whereby other institutions who were interested in accessing the content could also help sustain the operation. For that reason, it seemed to make sense to try and get some kind of site licensing deal, and to apply for government grants and such like.

RP: What success did you have?

LC: None. First, we discovered that we weren't structured in a way that would allow us to negotiate with the site licensing process, because we didn't have a businessperson who could manage and sign contracts. Second, it turned out that our chief librarian was also the chair of the national site licensing project at the time, and so she had to excuse herself from the bidding process. The upshot was that our bid was placed on the side.

RP: Not a great outcome then.

LC: Not at all. What was particularly unfortunate was that this was a time when there was a lot of debate about where libraries should be putting their money: should they be putting all their money into the "big deal", or should they be putting some of it into supporting a small deal like Bioline.

RP: One of the criticisms of the big deal was that it ended up increasing the power of large publishers, and so serial price inflation.

LC: Exactly. One unintended consequence of the big deal was that it sucked up more and more of library budgets, and so small publishers and initiatives like Bioline were increasingly marginalised and forgotten.

RP: What happened next?

LC: What happened next was that the main campus library said they couldn't afford to keep supporting Bioline. By then they had been funding the entire cost for two full years, and since we had to have a part-time coordinator and a bunch of support people to help do the document conversion — and we had hired people here to do that — it was costing money.

RP: How many people were recruited?

LC: Initially we had three part-time employees and a half-time coordinator.

RP: At this point Bioline was not an Open Access project as such was it?

LC: No. Participating publishers were able to choose whether to make their journals available on a charged-for basis, or whether to make them freely available on the Internet — it was entirely up to them. Some immediately said that we should make the papers freely available, because they didn't get a lot of subscriptions anyway; others said they definitely wanted to charge as whatever money we could get for them would be incredibly important for their operations.

So at that time we had a mixed bag: some journal content was free, and some was pay-per-download.

RP: How successful was the pay-per-download?

LC: It wasn't. The idea was that we would distribute the money back to the publisher, but keep 10% for overheads. So we set up a payment system, and in the first two years we sold, as I recall, just eight articles!

The irony was that the University was only able to process payments made by cheque, and so when someone sent an $8 cheque we would get less than $1. It was only later that my financial administrator pointed out that it costs the university $5 to process an $8 cheque!

RP: So you were in any case making a loss on each sale.

LC: And that got me thinking about the high cost of blocking access to research. I thought, "Wow, in order for people to register and pay we need to maintain all this technology. We then have to process that payment, and we have to keep track of the payments. Then we have to make sure we get receipts." I realised that that was a huge amount of work for processing a subscription — one whose rationale was essentially to lock people out.

RP: Moreover, just because you charge people for accessing content doesn't mean that you make any money from doing so, or that you even become self-financing.

LC: So that is why I became interested in the whole notion of the costs and benefits of access. Does it make sense to lock people out in order to get eight sales in two years? Surely, I thought, it would be better if we made all this openly available and just see what happens.

RP: So the decision to go fully Open Access with Bioline grew out of your attempts to find a funding model?

LC: Yes. And remember this was the time — 2002 or 2003 — when the whole issue of who funds what was being discussed. And following the introduction of the big deal librarians were really starting to struggle over how they allocated their limited resources.

And yet at the same time there were all these possible innovations. In 2001, for instance, the OSI had called a number of us together in Budapest to form what was later known as the Open Access Initiative. So the OSI brought together a number of individuals and organisations who are active in scholarly publishing — The Public Library of Science, Peter Suber, Stevan Harnad, Jean-Claude Guédon, myself etc. — to brain storm and come up with a collective vision of how things could move forward.

RP: Let's come to the Budapest meeting a little late. Tell me: How many journals does Bioline host today?

LC: Right now we have 61 active journals — that is, journals that are constantly updated. In addition we have another 15 or 16 that are no longer updated, or who decided not to continue with us on an Open Access basis.

Open Access

RP: So when Bioline went OA you told all the participating publishers that henceforth they had to do it on an Open Access basis if they wanted to continue distributing their journals via Bioline, and some pulled out?

LC: That's right; although that didn't happen until early 2004. At that point a number of journals dropped out because they didn't want to be entirely Open Access and today all those publishers that remained with us, along with those who have subsequently joined us, have to make their content freely available online.

RP: What was the impact of going Open Access?

LC: Well obviously we don't derive any funds from making the content available. And since participating publishers don't pay us a dime to put it online we don't earn any revenue that way — so there was no impact on funding.

RP: What about impact on usage?

LC: We saw a tremendous increase in usage, not only in visits but in unique downloads and in visitors. In fact, today Bioline consumes most of the bandwidth delivered by CRIA. CRIA has a lot of projects, but Bioline undoubtedly gets the most traffic.

So we discovered that people want to access the content of Bioline, but they don't want to pay $8 to read the text, for whatever reason — either it is the cost, or simply the hassle of having to send the money in. They were happy to read the abstracts, but they would not generally click on the full text. Then once the articles were open and freely available they began to download them all the time.

RP: Can you put some figures on that?

LC: Sure. The number of hits we received on the Bioline server at CRIA increased from 43,441 in September 2003 to 437,150 in April 2005, and the total number of hits in 2004 amounted to 2,014,790, with an average of 167,899 hits per month. Last year this had grown to the point where we saw 3.5 million papers downloaded.

RP: You also host content at the University of Toronto I believe?

LC: All the journal content is housed in the CRIA server in Brazil. But in 2002 we also set up an EPrints server (using the open source software from EPrints) to support Bioline.

RP: Why?

LC: For two reasons. First, the main Bioline system at CRIA at the time was not OAI compliant and we felt that it was important to use the EPrints server to further expose the metadata and hopefully usage of the Bioline content.

Second, we were using the EPrints server as an experiment to see if our journal partners would make use of the server to archive additional content or journal-related material. As it turned out, there was very little usage of the server from our partners.

Later, when the Bioline system in CRIA became OAI compliant, and when our university also set up an institutional repository where we could archive the Bioline content, our EPrints server became redundant and we discontinued it in 2005.

RP: How many records are there in Bioline today?

LC: We have close to 16,000 full text documents on Bioline today. A [list] of the journals we host is available on the CRIA site, along with their [country of origin].

RP: Can you give me an example of what impact going OA had on a specific journal?

LC: A good example would be the *Journal of Postgraduate Medicine* (JPGM), which is a publication of the Staff Society of the [GS Medical College and KEM Hospital] in Mumbai, India — which was founded in 1955.

JPGM joined Bioline in June 2002, and at that point began to provide free access to its content, both through the Bioline platform as well on its own [web site] a year later. In terms of general usage, JPGM received a total of 2,635 hits in 2002 at the Bioline main server and the hits increased to a total of 43,392 in 2004. And as well as the data from server logs, there are other important quality indicators pointing to the positive impact of OA for the journal.

RP: Such as?

LC: JPGM has also documented significant developments in terms of author submissions and the country of origins of contributing authors. The total number of submissions, for instance, grew from 190 in 2000 to 629 in 2004; and the number of submissions from authors outside India rose from less than 10% in 2001 to 30%, in 2004. This demonstrates that authors from outside India have increasingly come to see JPGM as an "international" journal capable of reaching a global audience.

RP: What we learn then is that making content OA significantly increases its usage, and gives journals a much larger audience. In addition, it allows journals from developing countries to increase the submission level of researchers from outside the country, helping them to build a reputation as an international journal?

LC: The download statistics also show that users are coming in from all over the world too. While most of that usage (not surprisingly) comes from developed countries, we also get downloads from South America, India, and all parts of Africa. So usage is very well distributed.

RP: Ok, so you tried various ways to fund Bioline without success, and then you went OA — which increased usage. But it did not solve your funding problem. Presumably the University of Toronto is still fully funding the service?

LC: Right. The University has been funding Bioline's full operating costs for seven years. The bad news is that as a result of changes in the administration the University now wants to rethink its commitment to Bioline.

RP: So the funding situation is even more desperate today?

LC: It is.

RP: I think you did also get some funding from George Soros' Open Society Institute [[OSI]]?

LC: We did. After we had gone Open Access we had a lot of journals approach us and ask if they could join us. But we just didn't have the resources to take any more journals on.

We calculated that it would cost about $3,000 in labour per journal to convert a year's worth into electronic format. So we went to OSI and they gave us $30,000 to add 10 new journals to the system, which we did.

RP: That was a one-off thing?

LC: It was. Essentially we wanted to do two things. First, we wanted to see whether our estimate of the costs needed was accurate. Second, we wanted to see what kind of journals we would be able to attract as a result of going Open Access.

After we got the grant and made an announcement in 2005 we immediately had a huge number of journals ask to be taken on. From these we chose ten journals from different developing countries, including Iran, Uganda, Venezuela, Brazil, and Bangladesh.

RP: You mentioned the Budapest meeting earlier. Was the decision to make all the content in Bioline Open Access a consequence of your attending the Budapest meeting?

LC: You could say that. Certainly it was galvanised by that meeting although, as I said, we didn't make the decision to go fully Open Access until 2004.

BOAI

RP: Ok, so let's move on to the Budapest meeting and the Open Access Initiative [BOAI], which took place in 2001. OSI's Melissa Hagemann tells me that you were invited to the meeting on the strength of your involvement with Bioline. At the time Bioline hadn't gone OA of course. So what was it about Bioline that attracted OSI's attention do you think?

LC: Right, although the journals we hosted were a mix of open and non open at that time, so in a sense we were experimenting with OA. In addition, of course, our content was focussed on developing countries, which would have attracted Melissa's attention.

RP: And OSI takes a particular interest in developing countries.

LC: Exactly. OSI was particularly interested in helping developing and transitional countries at that time, and they wanted to understand the needs of these countries. No doubt that would have been one of the major reasons why they were interested in Bioline.

RP: I have spoken to a number of people who attended the BOAI and they all say that the discussions that took place were pretty heated. What is your recollection of those discussions, and your view of the compromise — if you like — that came out of Budapest?

LC: Well it is true that the discussions were what one might call spirited at the meeting itself, but my recollection is that it was a lot more heated afterwards.

RP: How do you mean?

LC: There was a two month follow-up period after the meeting. This took place online, with email going back and forth as we drafted the Budapest Open Access Initiative declaration. This was led by [Peter Suber](#), and my memory is that these online discussions were a lot more heated than they had been in Budapest.

RP: Why?

LC: Because as we tried to hammer down the fine points there were a lot of specifics that people didn't agree on.

RP: Such as?

LC: Issues like whether it was more important to push for depositing papers in repositories, or to urge researchers to try and publish in Open Access journals; and if the focus was to on be Open Access journals how could they be funded.

RP: And the respective merits of what later became known as Green OA and Gold OA have dominated discussions in the OA movement ever since. Advocates of Green OA argue that researchers should continue to publish in traditional subscription-based journals, and then [self-archive](#) their papers in an online repository. Those who support the Gold Road, by contrast, argue that researchers should publish in new-style OA journals which — instead of putting published papers behind a subscription pay wall — make them freely on the internet at the time of publication.

LC: And at Budapest we agreed that both of those routes to Open Access should be supported and encouraged — although at that point the terms themselves did not exist. In fact, we didn't agree on the term Open Access at Budapest either. That came out of the back-and-forth email process after the meeting.

RP: In retrospect the Budapest meeting is viewed as being a very significant moment in the development of the OA movement. As you say, the term Open Access itself was developed as a result of that meeting. How significant did you feel that the meeting was at the time?

LC: Well, we knew that things were beginning to change. [Biomed Central](#) had started publishing OA journals, and everyone was very excited about the Public Library of Science ([PLoS](#)) [Open Letter](#), which had just gotten 34,000 signatures.

RP: The PLoS letter called for researchers to boycott journals that did not make their papers freely available within six months of initial publication.

LC: Yes. And it was very much in reaction to the high costs of scholarly journals.

At the same time there were people like [Stevan Harnad](#) — who was one of those to attend the Budapest meeting — who were very excited about repositories and repository software like [EPrints](#).

So there were a number of different things going on, and we knew we were on to something that the publishers would not be able to ignore indefinitely.

RP: What were your impressions at the meeting?

LC: There was a sense that there was something positive we could do, so long as we put our collective minds to it.

RP: Although as you said, there were disagreements over what strategy to adopt.

LC: Sure, but it was also clear that we all had this common objective of improving scholarly communication. So while there were a number of different groups all working on different aspects of this, we realised that we could never be as strong on our own as we would if we created a group of like-minded people, all pushing forward with different ideas but with the same end goal in mind. So we had a strong sense that if we can do something together it will make a difference.

RP: What in your view did the Budapest meeting achieve?

LC: I think its real achievement was exactly that: to bring together different people active in different areas of experimentation with — let's not say Open Access (since, as you say, the term didn't exist at the time), but access to research — and to get them to agree on a common vision of how to move forward.

The fact is that before Budapest there was no common vision, and there was no Open Access movement. That all grew out of that meeting.

RP: So while there are still frequent, and sometimes bitter, disputes about tactics and about strategy, the fact that a common goal was agreed at Budapest means that there is at least a shared view of the end objective: for all research to be made freely available on the Internet. The disagreements are only about how one arrives at the endpoint?

LC: Exactly. And that is just fine. I always liken it to the way that Darwin understood evolution. First you have to come up with the evidence, and then you have to explain it. What Darwin was able to do was come up with the evidence that there is irrefutable proof of evolution. How the mechanism for that actually works is still being debated today: Is it by natural selection, for instance, or is it a consequence of different kinds of accidents. Those details are still be fully explained.

What was agreed at the Budapest meeting was that Open Access is inevitable. How we get there however remains a matter of debate and fine-tuning. As I say, that is all just fine, and the way it should be.

Green or Gold?

RP: But as we agreed, it was at Budapest that the two sub-movements — Green and Gold — first materialised?

LC: Actually I think it is too simplistic to characterise the movement in this dualist way. You have, for instance, people like BMC who have a pretty clear business model based on the author-pays Open Access journal. PLoS is also an Open Access publisher today, but at the time of the Budapest meeting it didn't have any model at all: it was just saying, "Peer review is done by authors like us, so why are

we doing it for all these expensive journals. We should stop and not start again until we have forced the publishers to change their ways."

So I would say that views within the Open Access movement are both looser and more diverse than might at first appear, and always have been. Moreover, they change over time.

RP: Although people do talk about the two roads to OA.

LC: They do. You also have a person like Stevan, who has always had a very clear vision of achieving Open Access by means of repositories. As you know, Stevan has a masterful way of simplifying these things in order to crystallise the debate more clearly. But even within the repository movement there has been diversity, and there has been fine tuning — both at Budapest and since. For instance, there was no discussion whatsoever about mandates at Budapest. There simply wasn't any talk of mandates in those days.

RP: Right and talk of [mandates](#) grew out of the obvious reluctance of researchers to self-archive their papers. If they won't do it on their own, it was felt, then they should be made to do it. And so there have been growing calls for both research funders and research institutions to require researchers they fund, or employ, to self-archive. Was it Stevan who came up with the terms Green and Gold?

LC: Yes, he introduced the terms Green and Gold in order to simplify the debate but, as I say, when I look around I see a lot more diversity than that implies. Within both the Green and Gold parts of the movement there is a lot of mixing and matching.

Actually, I wrote a [paper](#) about mixing green and gold within Bioline, so I for one don't see them as being strictly dichotomous.

RP: There would be no point in asking you on which side you stand in the Green versus Gold debate I guess!

LC: [Laughs]. Let me answer that in this way: I spoke earlier about my primate research. One of the things that I was looking at was the whole notion of hybridisation, and specifically why the macaque is one of the most diverse species around the world. The problem with answering that kind of question, however, is that we don't know exactly what the macaque species is, since they are always interbreeding.

So I have always had a problem with this whole notion of saying that we have one species and then another species, and we integrate them or hybridise them — because it presupposes what that species is in the first place.

RP: That's a great answer, although in theory we know what Open Access is, since it was defined at Budapest. What people most argue about today is how to achieve it, and what its impact will be?

LC: Yes but we don't know what an [institutional repository](#) is supposed to be yet. Stevan has a very clear view that it is this place where we store postprints and preprints. But I see a repository as being much broader than that. I see it as a place that could also be used to store data, and all kinds of other scholarly artefacts — arguments, proposals, and so on.

RP: Presumably then you would be sympathetic to the views of [Clifford Lynch](#), who also takes a very broad view on the role of an institutional repository. In his seminal 2003 [paper](#), for instance, he defined an institutional repository as being, "a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members." That implies more than postprints and preprints doesn't it?

LC: Yes, and I have also written a [paper](#) on how repositories could support scholarship in more diverse ways.

RP: Lynch added that institutional repositories might also be considered as community or public repositories. As he put it, "this may in fact be another case of a concept developed within higher education moving more broadly into our society. Public libraries might join forces with local government, local historical societies, local museums and archives, and members of their local communities to establish community repositories. Public broadcasting might also have a role here." Would your vision of an institutional repository extend as far as that? And can you see universities, for instance, allowing people who are not members of the institution to use them?

LC: I can. In fact, that is what we have done with the University of Toronto's institutional repository [T-Space,](#). A colleague of mine, for instance, works with surgeons in East Africa, and a lot of younger graduate students. So they have set up a community on the University of Toronto's institutional repository that allows the senior surgeons to mentor younger surgeons, helping them to write scientific papers and so on.

This allows these younger surgeons to put their preprints up on T-Space in order to get comments from senior members. So they can work on the paper until it is in a form where it can be submitted to an international journal.

RP: You are saying that surgeons based in East Africa can also deposit in T-Space, if they are being mentored by a member of UoT's faculty?

LC: Exactly. So where some universities will define their community as being restricted to those who work within the university, we define community very broadly, and also include anyone who is working with University of Toronto faculty members. Anyone can set up a community on T-Space, so long as they themselves are an affiliate of the university. If they have collaborating colleagues in the developing world all the better; these people can use it too.

RP: Another area of disagreement around repositories of course is whether researchers should choose to self-archive their papers in central subject-based repositories like [arXiv,](#) or in their institutional repository.

LC: And that is another question that was there right at the beginning of the movement, and is still being debated: should repositories be run by individual institutions or should they be central subject-based repositories like arXiv. We should note here that although he is the most vocal advocate for institutional repositories Harnad himself experimented with a subject based repository at one point.

RP: [CogPrints](#).

LC: Yes. It was after experimenting with CogPrints that Stevan concluded subject-based repositories are not scalable, and that individual institutions should be the primary locus for self-archived papers.

RP: The other interesting piece of this perhaps is that EPrints — which was the first institutional repository software to be developed — was initially developed for a central service (CogPrints).

LC: Indeed and as I said, we set up an EPrints server on my campus at the University of Toronto Scarborough. And we, by the way, were the first site to use EPrints to experiment with an institutional repository. So we were very keen to explore the institutional repository route from the start.

RP: What year would that have been?

LC: We installed the first version of EPrints as a general experiment, and that must have been in 2000. As I said, we also set up an EPrints server for Bioline in 2002.

RP: Presumably you believe that researchers should be encouraged to self-archive in their institutional repository, rather than in a centralised repository like arXiv?

LC: I don't have strict views on the matter, in the same way as I don't have any mantras about the best way of achieving Open Access. I view all current approaches as important, including institutional repositories, central repositories, and Open Access journals.

That said, I think Stevan is right to argue that we should start with the low-hanging fruit, which means putting the material that is already out there into repositories, and then harvesting them with a service like OAIster.

RP: You mentioned OAI earlier, which refers to the Open Archives Initiative Protocol for Metadata Harvesting. The point about the OAI protocol is that it doesn't matter whether a paper is placed in a central or an institutional repository, since harvesters like OAIster can aggregate the content from all of them and treat the entire corpus as one virtual archive. So the key decision is not what kind of repository you put your papers in, but whether you make the necessary keystrokes!

LC: Yes.

RP: And your reference to low-hanging fruit goes to the point Harnad constantly makes that converting the world's 24,000 journals into Open Access journals will take a long time, and require a lot of effort. Open Access could be achieved almost overnight, by contrast, if every researcher began to self-archive their papers tomorrow.

LC: And so I totally agree with Stevan that there is plenty to be done right now, like yesterday. There is also no doubt in my mind that the journal as we know it will be completely transformed going forward in any case.

RP: Transformed in what sense?

LC: In the sense that we won't be issuing journal volumes and such like. In fact, these are already slowly disappearing in any case. So my view is that it won't be very long before we have a very different kind of scholarly communication system; one in which the whole notion of journal versus repository will be totally blurred.

But so far as repositories are concerned I think the most interesting stage will begin when people build additional services and tools on top of the content in open repositories.

RP: Beyond harvesting services like OAIster?

LC: Yes, I'm thinking about the kind of thing that Peter Murray-Rust is doing so well in chemistry, which you discussed with him recently. The real value of the content, and the data, in repositories will reach its peak only when we can create tools that can extract new knowledge from all the open content.

RP: Peter Murray-Rust is a leading advocate for the Open Data movement of course, which is quite a new development? So where the Open Access movement has really always been focused on getting papers freely available on the Web, people like Peter Murray-Rust have come along and said, "Wait a minute, it's not enough just to provide access to the text, we need the data too".

LC: And I totally agree with that. The paper is just the bare minimum; and it is the data that will make it so much more dynamic and useful. After all, by the time a paper has been published the data has been highly interpreted, and kind of fixed in a certain direction. People should be able to come along, take a look at the data, and then say, "Oh, no. You can also look at it this way and, in fact, if you combine this data with that data you get something totally different that you hadn't thought about before."

RP: That's certainly one aspect of it. I guess the other is the Semantic Web, which people like John Wilbanks of Science Commons are promoting very actively. This is the argument that says that the key to building on published research in the future will lie not so much in maximising the number of eyeballs that can read it, but maximising the number of machines and software agents that can parse the data in it?

LC: Exactly. It is now impossible for humans to comprehend the massive data sets that are being created across space and time. If you look at the data on primate populations over the last 30 years, for instance, it just boggles the mind. If, however, you can put that data in a machine, and have the machine process it, you can extract certain patterns that you wouldn't otherwise see.

When we start doing this on the literature, whole new worlds of research are opened up, and I just can't wait to see it happen.

Pushback

Workshop on Open Access, MS Swaminathan Research Foundation, Chennai. 2004

RP: Ok, we've talked about the problems faced by researchers in developing countries when trying to get access to subscription-based journals, we've talked about Bioline, and we've talked about different Open Access strategies. I'd like now to focus in on Open Access strategies specifically within the context of developing countries. But let me first check my understanding: Bioline is not a publisher, since it only provides an electronic platform for print journals unable to put their content online by themselves. By putting papers on the Web for publishers you could be said to be offering a Gold service, although there are no article processing charges [APCs] involved (That

said, [many] Gold journals don't charge an APC today either). On the other hand one could argue that Bioline is really providing a Green service for the authors, by archiving their papers for them.

LC: Yes, and that's the point I made in the [paper] I referred to earlier. I also said that at the same time as we put the papers on the web site in Brazil we also dumped them all into our EPrints server at the University of Toronto. In addition, we opened up the EPrints server to the publishers, and said that if they had any other articles, preprints, or whatever, that they wanted to put in the server then they could do that too.

RP: Ok, that is the server that you later closed. But I have [spoken] in the past to your fellow OA advocate Subbiah Arunachalam [Arun] — who is undoubtedly the most active OA advocate in India. In talking to him I formed the impression that he believes institutional repositories work better for developing countries, and so worrying about journals is not necessary. Do you have any sympathy with that view?

LC: Well, Arun is a very pragmatic person, and has a very broad view about access to knowledge. And I can tell you that when he is doing his political roundabout throughout India he doesn't just talk about institutional repositories; he also talks about Open Access journals and all the other ways in which you can improve access.

RP: You mentioned that journals are likely to be transformed. I am conscious that in many areas of new technology today one hears the argument that developing countries have an opportunity to leapfrog the developed world. For instance, some say, it would take a very long time, and would be very expensive, to install a wired broadband infrastructure in most developing countries. Given that the future lies in wireless technologies, they add, why bother? It would be far better to invest the money in installing the very latest wireless technology. I wonder if a similar argument could be made with regard to scholarly journals. If we are saying that they will become something very different, and increasingly begin to merge with repositories, maybe researchers in developing countries would be better to focus on building a network of institutional repositories, and not worry about journals?

LC: There is some merit to that argument, but you have to understand the context within which Arun and I argue in favour of institutional repositories.

RP: Talk me through that?

LC: For countries like India, China and Brazil, where there is a fairly substantial science base within a specific group of universities, you will find that most scientists publish their papers in Western journals rather than local journals. And they are encouraged to do so because they can get much better recognition if they publish outside their own country. This means that many of the scientific papers published by Indian scientists are published outside India in, say, Elsevier and Blackwell journals.

RP: In this case then the role of the institutional repository is paramount, since Indian research institutions are less likely to have subscriptions to the Western journals their scientists publish in than research institutions in the West?

LC: Correct. So this is the dilemma that Open Access repositories need to resolve for developing country scientists. After all, if a lot of your research output goes outside the country, you really need repositories in which to deposit that research so that other scientists and students within the country can read them. That is the basis of the argument that Arun and I make for institutional

repositions in developing countries. The simple fact is that colleagues of these Indian scientists are unlikely to have access to their papers unless they are self-archived.

The second reason for scientists in developing countries to self-archive is that it enables papers that they publish locally to gain greater exposure, and they can do so using the same infrastructure. Faculty like to have all this literature — international and local — available together, so it makes a lot of sense from that point of view as well.

RP: This still seems to suggest that Green makes more sense. However, I guess if they can get an [APC waiver](#) and publish it in a Gold journal the publisher will make it OA for them, so in that sense Gold does make sense too.

LC: Correct.

RP: Although what this suggests is it is developing world scientists who still choose to publish in Western journals that really need to be educated about OA.

LC: And their funding agencies. So, for example, since it is the Indian government that is funding Indian research it is vital that the Indian government is cognisant about what is happening to the locally-produced literature that is going outside the country, leaving it inaccessible to so many other researchers in their country.

RP: I get the feeling that this process of education is harder in developing countries. When I spoke recently to the director of [SPARC](#) [Heather Joseph](#) she said she was very conscious of a constant pushback against Open Access. Given that developing countries would appear to have more to gain from Open Access that surprised me. Nevertheless, Joseph told me, when she was at a recent WIPO meeting she was struck at how representatives from developing countries were nervous about Open Access. Some, for instance, argued that developing countries were vulnerable to having their papers mined by companies in the West, who would steal ideas and innovations from the developing world. Such fears presumably pose a real threat to Open Access, if only in slowing down its development?

LC: I hear that a lot too. Last November, for instance, I was in Botswana. I heard that exact argument when speaking to a couple of vice chancellors there. One of the VCs has studied traditional African medicine and wanted to publish his findings, but he said that he is afraid that Western pharmaceutical companies will steal ideas from his work, patent them, and then rip off local people, as has happened in other instances.

RP: This is what people call [bio-piracy](#)?

LC: Indeed. But I put it to him that this is exactly why the developing world needs Open Access. If he publishes his papers and make them available on an Open Access basis, the whole world will know that he was the original author. If anyone then steal from his papers he will have proof that they had stolen from him. On the other hand, I said, if he keeps his work a drawer not only will he not be sharing his knowledge with others, but if someone stole his work from his drawer he would have no resources to fight the theft in the international courts.

At the end of the argument he said, "Yes, that is a good point. I didn't think about that: Openness is the best way to fight piracy."

RP: There is in any case a more likely way in which Western companies will plunder research produced by the developing world, and I believe you have some concerns about this. We discussed the way in which research is effectively appropriated by Western publishers — since authors have to sign over copyright as a condition of publication, and it is then placed behind a pay wall. And we saw how in the context of the developing world this means that locally-produced research becomes inaccessible to the author's own colleagues. You pointed out that the way to overcome the resulting access problem is for researchers to self-archive their papers. Another solution, I guess, would be for researchers to publish in local journals. But it turns out that Western publishers are appropriating developing country journals too — because if a local journal becomes successful it is likely to be acquired by a Western publisher looking to expand its portfolio.

LC: Yes, and there are a number of concerns here. As you say, Western publishers constantly go out and scout out potentially profitable titles that they can add to their own collection, particularly where it allows them to claim that they now have content from, let's say, Mexico.

But if a small publisher in Mexico is taken over by a big publisher its operation is usually moved outside of the country — because it is more cost effective to centralise the work. As a result, the work is shifted from Mexico to, perhaps, Europe — where they have a big publishing shop — or maybe to India where they have a low-cost outsourcing shop. The end result is that a little local editorial office established somewhere in Mexico is killed off, and the people who were trained to do scientific publishing work there suddenly find themselves out of a job.

RP: This is the reverse of outsourcing?

LC: And it has happened over and over again. A good friend of mine based in Nairobi [Daisy Ouya](), for instance, used to be the scientific editor for a local journal called [Insect Science](). One day the owners of the journal were convinced by the large Western publisher [CABI]() to publish with them. So the journal went into CABI, and into [EBSCO](), and as a result the editorial office in Nairobi was closed down, and Daisy and her colleagues lost their jobs. In Daisy's own words, that was "the last nail in the coffin of local publishing in Kenya".

RP: I can see the problem, but this is not so much Open Access issue I suspect?

LC: Yes and no. The point is that these journals are not aware of the options available to them. They assume they have to either struggle on with a very small local print circulation, or sell out to a western publisher who promises to save them from ruin. They see only those two options.

RP: There is an Open Access option?

LC: There is. Another option is to use whatever funding they have to find an alternative business model, and become Open Access. The problem is that none of the journal publishers and editors that I speak to ever seem to be aware of this.

That said there are some exceptions: There is a journal based in Uganda, for instance, called *[African Health Sciences]()*, published by [James Tumwine](). *African Health Sciences* is one of the few African medical journals indexed in Medline. Instead of selling the journal, Tumwine lobbied all kinds of funding agencies to give him money to publish the journals. And in doing so he persuaded them not to put conditions on him that would require him to charge subscriptions to raise revenue. Eventually these funding agencies said, "Ok, we will fund you regardless, and see what happens."

RP: What did happen?

LC: Over the last three and a half years Tumwine has been able to attract a lot of high quality submissions, and contributions to the journal have been improving. We have also seen lots of usage through our web site.

RP: Ok, so African Health Sciences is also available online through Bioline. Your point is that Bioline offers journals in developing countries a third option?

LC: And so we need to educate the funding agencies that support journals in developing countries and remind them that the increased visibility of research findings and their usage, which is why a journal is established in the first place, far outweigh the limited subscription revenue generated from most journals in the developing world.

RP: The point here I guess is that these journals are never going to be entirely self-sufficient, and so will need to be subsidised if they are to survive and remain independent.

LC: Sure, but if these funding agencies believe in their mission of public education and public health improvement and so forth, they need to fund these journals. They need to do so in order to ensure that they are well read, well circulated, and that the research in them is built upon.

But there is something here for the funding agencies too. They can say that they are producing results: That they are putting money into these journals, and the journals are being read and their ideas are being circulated. And as a result, public health is being improved.

Business models

Leslie Chan and Raym Crow, SPARC Senior Consultant at the Great Wall, China 2005

RP: This does, however, bring us to an important point: Everyone knows that Open Access is — as Harnad likes to put it — "inevitable and the optimal". But no one has yet demonstrated that there is has a long-term viable business model capable of supporting it. The key question therefore is, "Does a viable business model for Open Access exist?"

LC: And it's a good question!

RP: It's certainly the question confronting Bioline today isn't it? You have shown that OA increases usage, and you have shown that it allows researchers to a) maximise the visibility of their own research and b) ensure that they are not locked out of their colleagues' research. But here you are, fifteen years after it was created, still struggling to fund Bioline. Meanwhile the University of Toronto is about to pull the funding plug on you.

LC: That's true. And that is why right now SPARC is helping Bioline to formulate a business model. We've had the benefit of receiving a subsidy from the University for the past few years, and that has allowed us to research the potential market out there. But these kinds of things take time.

RP: I understand that SPARC's Raym Crow is advising you on this?

LC: You are well informed!

RP: I had an email conversation with Crow about Bioline and how it can be funded. Crow put it this way, "Subsidies work best when they support activities central to the strategic objectives of the subsidising institution — and, apparently, international health and tropical medicine are not central to Toronto's research or teaching agenda. Leslie was disappointed when the Toronto administration first signalled its intent to dial back the subsidy and he felt that it was an institutional obligation to support Open Access."

LC: Correct.

RP: Crow added, "However, I believe that Leslie now recognises that the most stable funding models for Open Access initiatives will target the audiences that benefit most directly from them. I'm confident that Leslie's commitment to Bioline's success will ensure the initiative's transition to a funding model that relies on earned revenue models (including, potentially, voluntary access fees and a sponsorship program) to supplement a reduced subsidy from Toronto."

LC: Yea and I agree with that. The important thing is that it gets my administrators off the hook!

RP: How do you mean?

LC: In principle they like to subsidise as much as they can, but they have made it clear to me that if they continue to spend that much money on one project then they won't be able to help other people who go to them with equally worthwhile projects.

The issue simply: How many worthwhile projects can a university support without the larger community also buying in and helping out? That has been their chief concern.

RP: Can you say more about the revenue models you and Crow are exploring?

LC: What we are currently looking at is a way to get research libraries from developed countries to contribute, on a voluntary basis, to the Bioline operation. We can see that a lot of these libraries download our content regularly, so our hope is to build a model based on voluntary payments.

RP: On the basis that they are the people who most benefit from Bioline?

LC: Yes. So we would go to these institutions and say, "Your researchers have been using our content for the last few years, and will probably continue to do so; would you be willing to put in x number of dollars." We would be talking about a very small amount of money, probably the cost of subscribing to a single journal for example.

RP: The key thing is to identify those institutions then?

LC: Exactly, so we need to get a better handle on the downloads, and see exactly where they are coming from. In other words, we need to establish what organisations the people who are downloading Bioline papers come from, and what they do with them. That is one of the things that Raym will be helping us with.

We also realise, of course, that downloads are only half the picture, because in developing countries many people generally share the same terminal. Many will do their downloading in an Internet cafe,

or from the library, for instance. So the raw data is often not enough in itself. You may appear to have one unique visitor, but the figures may mask the reality that what you think is one user is in fact many users.

RP: So once you have established who is downloading papers from Bioline you can go to their institution and ask for a contribution, on the basis that you are only asking them to pay for something they are directly benefiting from.

LC: Correct, and keep in mind that Bioline does really operate on a shoe-string budget. Today we still have a part-time coordinator, plus some part-time students — a bunch of volunteers to help do the document conversion basically. But volunteers or not, the bottom line is that it takes money to sustain Bioline.

RP: How much money?

LC: Well, over the last couple of years we have been running somewhere in the neighbourhood of $70 to $80,000 Canadian dollars a year [US$68,000-$78,000). And the majority of that still goes to document processing.

The point is that a lot of the libraries who use Bioline don't mind paying, particularly those institutions that have research interests matching the content of our database. What we need to do, therefore, is to target more of those research institutions — those who do research in tropical medicine, health, development, and so forth. And there are many of them out there.

So it is largely a question of putting resources into identifying them and then marketing the idea to those institutions.

RP: This would be similar to the institutional membership [scheme](#) that Biomed Central operates would it?

LC: Certainly, membership is one way we could do it. Alternatively, it could just be a case of asking how much they spend on their resources, and whether they would be willing to spend a small percentage of that on this other resource.

RP: When I spoke to Joseph about Bioline she talked not just about subsidies, but also revenue opportunities. Likewise, Crow said to me, "One of the challenges of developing sustainability plans for academic publishing initiatives (Open Access or otherwise), is the difficulty such initiatives face in transitioning from institutional subsidies to revenue-generating models that frequently require market-oriented skill sets and/or commercial discipline to execute. It takes energy and commitment to adapt to such a new operating model, and not everyone in an academic environment is interested in expending the effort." This implies that you will need to look beyond subsidies alone?

LC: Again, I completely agree with what Raym says. It costs money to produce high quality resources, everybody understands that. So the question is: "Who pays?" We are not talking about getting something for nothing. So what Raym and Heather are trying to make me understand is that you need to have a stable business model.

RP: And this is the same problem facing the whole OA movement: Who pays, for what? On one hand, of course, this is a greater challenge for Bioline than, say, an OA publisher. All you provide is a distribution platform, so you can't even charge a publication fee in the way that an OA publisher

can. On the other hand, APC rates have also [become controversial](#). Again we face the question: Is there a viable business model for Open Access?

LC: The point to bear in mind is that there is lots of money in the system right now. After all libraries — through government subsidies — are paying truckloads of money to the big publishers today. All we are saying is that a lot of that money could be redirected. That is precisely what the [SCOAP^3](#) project is doing, and on a massive scale.

RP: SCOAP^3 is the model that the high energy physics community has pioneered. As the SCOAP^3 web site [puts it](#), with a scheme like this, "funding agencies and libraries, which today purchase journal subscriptions to implicitly support the peer-review service, federate to explicitly cover its cost, while publishers make the electronic versions of their journals free to read. Authors are not directly charged to publish their articles OA." Essentially the high energy physics community is forcing HEP publishers to convert from a subscription model to an Open Access publishing model.

LC: But doing so by using money that is already in the system. So they are saying: All these libraries are collectively paying hundreds of millions of dollars to publishers for high energy physics journals. Why not collectively put this money together into a publishing consortium for high energy physics and everybody in the world can get access to the contents for free.

In other words, the money is simply being redirected. There is no new money that needs to be put in to replace the subscriptions; existing money is just being redistributed. What SCOAP^3 is saying to the libraries, and to some of the funding agencies, is, "Look you are committing all this money already; why not think about committing some of this money into alternative and long term sustainable models."

RP: Your point is that the task is not to find new money, but to use the money already in the system to better effect. Presumably you would also hope to stop too much of that money leaking out of the system. Some argue, for instance, that the main problem today is that an excessive proportion of that money is funnelled into the pockets of shareholders, in the form of the large profits that scholarly publishers can make. What is needed is for the research community to sweat that money more effectively?

LC: Exactly. So what we need to do is develop a system in which shareholders don't grow fat by taking money out of a system that can't afford to lose it. I have been playing in my head with the idea of a "1% Solution".

RP: How do you mean?

LC: Most research libraries spend millions annually on commercial licensing of content. What if each of these libraries committed 1% of their total acquisition budget to support OA initiatives? This is a small financial commitment, but a big step towards redressing the imbalance libraries have been practising in terms of support for commercial publishers and non-profit OA initiatives. The 1% fund is also key to the transition from a toll access to an Open Access world.

Managing the transition

RP: This raises an important issue of course: If the goal is to move from a toll access environment to an OA environment, then there is clearly a transitional challenge. For instance, if research institutions have in the interim to continue paying subscription fees that they are already struggling to afford, how can they find extra money on top of that to pay for APCs or institutional membership schemes? SCOAP^3 is one attempt to manage the transition.

LC: And for this reason last year the Social Sciences and Humanities Research Council set up an experimental program to fund an Open Access journal.

RP: What did that involve?

LC: The funding council created a set of criteria for evaluating Open Access journals, and arrived at an article funding model that would pay the journal an $850 subsidy for publishing an article. The aim was for research funders to fund journals to an upper limit, in terms of how much money the council would give you. This per-article funding would then allow the journals to make a transition to Open Access, to migrate from a subscription model.

The aim was that if the journal was not able to fund itself from the $850 rate it would have to come up with other revenue-generating devices — a membership fee for instance.

RP: As I understand it, we don't know the outcome of that experiment. Meanwhile, it seems that the University of California is exploring another model. If you talk to someone like Catherine Candee, for instance, or read the paper published recently by Jean-Gabriel Bankier and Irene Perciali of the Berkeley Electronic Press, you see that there is a growing view that the research community needs to re-appropriate the whole scholarly communication process. The argument seems to go like this: "Let's take back ownership of our research and publish it in institutional repositories. If publishers want to come in and offer services like peer review that's fine — they can build services on top of the institutional repository. But the research belongs to us, and we do not intend to let publishers appropriate it any more by insisting that researchers assign copyright of their papers to them as a condition of publication." Does that seem like a workable approach to you?

LC: Absolutely. But what I was talking about was a government funding approach.

RP: You mean using government research funds to force change on publishers, not having research institutions take control of scholarly communication themselves?

LC: Forcing change is a strong word but in my view clear policies from funding agencies are important. Once again the secret lies in a diversity of approaches: The more diverse ways we can develop to achieve the same end goal the better. What evolution tells us is that you are more likely to find success if you try three, four, or maybe five models than if you just try one. The more strategies we can have the better — because some of them are going to win out; or it may be a combination of them.

RP: The current system has been in operation since [Henry Oldenburg](#) founded [The Philosophical Transactions of the Royal Society](#) in 1665. Many people worry that by changing the system we could precipitate chaos, and destroy (or seriously disrupt) it. Clearly you don't believe that, but how would you reply to someone who said: "Look we're taking a huge risk here. Why is Open Access so important that we need to?"

LC: Well as associate director of Bioline my perspective is that of someone concerned to make research from the developing world more visible. So for me it is about participation. Today we have a very one-sided view of the world, since scientific publishing is dominated by western institutions.

RP: You are saying that where the current scholarly communication system advantages researchers in the West, OA can level the playing field? As such, this is an issue of fairness and equity?

LC: It's more than that; it's also about global science having a better view of things. As things stand we don't have a complete picture of the world from a scientific standpoint, and unless and until we integrate knowledge from all parts of the world that won't be possible.

RP: This goes to your earlier point about the 10/90 gap.

LC: It does. And as you say, the traditional publishing system excludes many people from access. Open Access allows for much greater inclusion. So Open Access includes more people, and it offers us a far broader perspective of science.

When publishers stopped laughing

RP: What would you say have been the key milestones in the progress of Open Access to date?

LC: From my perspective the first milestone we passed was when publishers stopped laughing.

RP: Laughing?

LC: Seriously, when we first started out and went to meetings, publishers would literally laugh at us.

RP: What were they laughing at?

LC: At Open Access. They would say, "Open Access? Ha, ha. You're just a bunch of diehard liberals and idealists. You don't know the first thing about publishing, you don't know the first thing about business, and you just don't understand the complexity of this and that."

Yes, I remember people laughing at us very distinctly. We would go to publisher meetings or scholarly conferences, and publishers would just laugh at us. Today we don't get laughed at. In fact, not only do we not get laughed at, we get treated very seriously all around the world. That's a big change.

RP: Although, as we agreed, there is still a great deal of resistance, not just from researchers in the developing world fearful that their ideas might be stolen, but from publisher coalitions like [PRISM](#). Scholarly publishers have proved really quite tenacious lobbyist, even if their behaviour has on occasions been, dare I say it, a little laughable!

LC: Sure, some publishers have been reacting in silly ways, but others are reacting in very serious ways, and rethinking their whole business. And that is a major milestone: we have made people rethink how they have always done things — and here I am talking right across the spectrum, not just publishers.

RP: Getting university administrators to buy into OA for instance.

LC: Yes. Today you can see university administrations becoming increasingly cognisant of Open Access, and you have important developments like the recent mandate from the faculty of arts and sciences at Harvard. That is a huge achievement, and I expect to see such initiatives spread.

RP: As I understand it, the Harvard mandate will require faculty members to grant permission to Harvard to make their scholarly articles freely available, and to exercise the copyright in those articles. Essentially, this will allow the University to put faculty papers into its institutional repository without having to worry about any contract their researchers subsequently sign with publishers — since Harvard will have asserted its right to archive upstream of any publishing contract. It's a way to avoid researchers signing over exclusive rights to publishers, and is not unlike the approach being taken at the University of California perhaps, which is also seeking to assert the right of the Regents of the University to archive faculty papers.

LC: Right. And I would certainly want to see that approach being adopted at the University of Toronto and across Canada.

RP: What is also distinctive about the Harvard approach is that it is a bottom-up approach, driven by faculty rather than the administration?

LC: Yes, and it is in contrast to the kind of mandate that Stevan Harnad has been pushing, which envisages provosts or other senior administrators mandating researchers from above. The problem with that approach is that most provosts and chancellors don't want to stick their necks out.

RP: But as Stevan frequently points out, a bottom-up approach hasn't worked to date — otherwise researchers would have been self-archiving for years, and any talk of mandates would be superfluous?

LC: Well we need both. If we have a bottom-up approach a lot of administrators will jump in and say, "Yea we are doing it too. We're doing this because faculty want it." The advantage is that it takes the burden off them. We want funding agencies to mandate for the same reason: it too will take the heat off the administration, who can say, "Well, the funding agencies have mandated it; we're just doing what the funding agency asked us to do."

RP: It's important to attack on all fronts I guess?

LC: Correct. The funder mandates allow senior administrators to allocate a budget for doing things at the institutional level. And the bottom-up move allows senior administrators to say that they are just doing what faculty want.

RP: Are there any other milestones you would point to as a sign of significant progress in the development of Open Access?

LC: I think the sheer number of Open Access journals now available is very impressive.

RP: That's true. The Directory of Open Access Journals [DOAJ] now lists nearly 3,500 OA journals.

LC: And that's a very encouraging number.

RP: On the other hand, publishers have been very tenacious in terms of pushback against OA, as we discussed. Do you think there is any danger that Open Access could be rolled back, or significantly slowed, in the future, or is it now an unstoppable force?

LC: Once again I would analogise OA with evolution. As I said earlier, to me evolution is a done deal; so all that remains is to work out the explicit details and fine points. The details are still being worked out and debated, but that's as it should be.

RP: Sure, but evolution currently faces its own pushback from religious fundamentalists.

LC: True, the pushback is stronger than ever, because these people see evolution as a fundamental challenge to their belief system. Likewise, a lot of business people see Open Access as a challenge to their businesses, where in reality it is an opportunity to create new business models.

In that sense the situation is similar to what the music industry is going through: If someone like Apple can make billions from selling music tracks for 99 cents it becomes clear that there must be ways of making a good living from open content. But as we discussed, someone has to come up with a business model first.

In Canada

RP: Let's focus in on Canada for a moment, which is where you are based. I'm impressed at the number of OA advocates there are in Canada today. In addition to you and Harnad there is also Jean-Claude Guédon, Heather Morrison, Gunter Eysenbach, Jim Till, John Willinsky, and Michael Geist. What do we learn from that?

LC: Well Canada has always been a country that takes a very principled support about equity in access to knowledge, and it takes a wide view on the topic.

RP: So publishers were right: OA advocates tend to be diehard liberals and idealists!

LC: [Laughs] Yea. But you should note that there is also no indigenous academic publishing of any significance in Canada. In fact, Jean-Claude and I did a [report](#) for the [Social Sciences and Humanities Research Council of Canada](#), where one of the conclusions we reached was that in terms of international recognition the journals published in Canada are on par with those published in developing countries. As such, they suffer from the same problem of low visibility, low circulation, and low submission, due to authors wanting to submit their papers to "international journals" published outside of Canada.

RP: So those publishers making most of the money out of scholarly publishing aren't Canadian companies?

LC: Well it's true that Canadian journals is (in terms of perception at least) are considered to be in the second or third-tier. But what I meant was that 80% of Canadian authors publish outside of Canada, so in that sense the situation is similar to the situation in the developing world.

RP: It also means, I guess, that there is less concern in Canada that Open Access could impact negatively on the Canadian economy. In other words, critics of Open Access will find it harder to resists Open Access by arguing that it will destroy local businesses?

LC: Right, exactly. We don't have big scholarly publishing businesses based here, or a large publishing lobby in the way you see in the US, or in Europe. That said, because so many of our authors publish these big companies there has been a lot of publisher lobbying here.

RP: What is the current status of public access mandates in Canada? I know there has been a lot of discussion about it, but what is the current position?

LC: Well you know about the situation with the Canadian Institute of Health Research [[CIHR](#)].

RP: They introduced a [mandate](#) in September last year didn't they?

LC: They did, but there is a loophole, as Peter Suber [pointed out](#).

RP: What is the loophole?

LC: There is an opt-out for authors. But at least the mandate is there. That is first step. The truth is that Canada is a fence sitter, and this is just another example of that.

RP: How do you mean?

LC: They were waiting on the NIH policy to be announced, and then the NIH policy was delayed so the CIHR had to put out their mandate and chose a watered-down version of the draft NIH version. Then the NIH announced a stronger version. Consequently, we are going to have to wait for the next round of the CIHR to see if it gets stronger.

However, what is interesting is that that Canadian Association of Research Libraries [[CARL](#)] — which includes all the major research libraries in Canada — are getting their heads together and doing something similar to what the American Association of Research Libraries ([ARL](#)) is [doing](#) in response to the NIH policy.

RP: Lobbying?

LC: Sure, but they are also producing implementation guidelines so that all the universities will know how to comply with the CIHR policy.

RP: This is part of the [Create Change](#) initiative is it?

LC: Yes, and it is a very helpful way of furthering the cause of OA.

RP: The NIH is the world's largest funder of medical research. How much of Canada's health research would be funded by the CIHR?

LC: Well, it is the biggest health funding agency in Canada, but I don't have the absolute figures.

RP: Would it be accurate to describe the CIHR as the Canadian equivalent of the NIH?

LC: It would.

RP: Are there any other funder mandates in the offing in Canada right now?

LC: There are mandates being considered by some of the smaller funding agencies e.g. the Ontario Institute for Cancer Research [OICR]. OICR is smaller than the CIHR but it still has a significant amount of funding, and it is in the process of drafting a very strong mandate on Open Access.

RP: You said that the University of Toronto was the first to install an EPrints server but that that repository became redundant when the University created another repository. That would be [T-Space](#) would it?

LC: What happened was this: As I said, the University of Toronto has three campuses. As a result, there have also been different repository implementations. I set up the EPrints server at the East campus in 2000 and it operated until 2005. Essentially it was an experiment we undertook into using a repository for distributing faculty's publication.

Then in 2002, when the [DSpace](#), software was unveiled, the University of Toronto [library](#) became one of the earliest [federated members](#) of DSpace; and as part of that political alliance the library installed the DSpace software rather than going with EPrints. And so the local install of DSpace is called T-Space.

RP: What happened to your EPrints server?

LC: I migrated all my content from the EPrints server into the T-Space server. We then discontinued the EPrints server in order to avoid any confusion.

RP: The Registry of Open Access Repositories [[ROAR](#)] records T-Space as having around 10,000 records, making it the third largest institutional repository in Canada. Does that sound about right?

LC: Yes. The [figure](#) should be on the site itself.

RP: You mentioned that some of the Bioline content was also archived in your EPrints server, and the EPrints records were migrated to T-Space. So those 10,000 records in T-Space will include Bioline content?

LC: It would include at least some of them yes.

RP: I see that ROAR also lists Bioline as a separate Canadian EPrints repository with around 3,000 records. What is that repository, and what are those records?

LC: As I mentioned earlier, that repository was set up initially to allow further exposure of the metadata of the Bioline content through the OAI-PMH and to allow Bioline's publishing partners and interested authors from developing countries to experiment with self-archiving. The server was decommissioned in 2005 as the main system of Bioline became OAI-compliant.

RP: Tell me, is there an OA mandate in the offing at the University of Toronto?

LC: Actually, no, not yet. For the moment the provost has effectively said that it is just not going to happen. That's why two or three years ago when we got some funding from the Provost's office to run the *Open Source|Open Access* project, we decided to put our energies into awareness raising, rather than on a mandate. But as I said, these initiatives will eventually inevitably spread.

RP: What is Project Open Source|Open Access?

LC: It's a broad-based project that kicked off all Open Source and Open Access activity in the University. The point is that the University of Toronto is a big university with three campuses — there is a central campus, plus an East campus where I am (which is the University of Toronto Scarborough), and then there is a West campus. As a consequence, we don't know who is doing what. One of our objectives, therefore, was to find out, and see whether there was sufficient interest within the university community to move in that direction.

RP: The Project is described as being: "a University of Toronto initiative to develop a networked community of scholars, students and members of the broader community interested in the phenomenon of Open Source and Open Access". I find it interesting that you have combined Open Source with Open Access. Presumably you see synergies between them. Not everyone in the Open Access movement does — Harnad, for instance, always insists that we should not conflate the two movements. So what in your view is the overarching principle that links the two different movements?

LC: Yes. Stevan has clear strategic and pragmatic reasons for wanting to be very focused. We, on the other hand, have very pragmatic reasons for being broader in approach. By taking a broader view we see more consistencies in the various open movements. Both Open Source and Open Access, for instance, are about peer production — to use Yochai Benkler's term.

RP: A term he discusses in his book, The Wealth of Networks? How would you define peer production?

LC: Peer production is not a new concept, but Benkler gives it a more theoretical basis, and he talks specifically about commons-based peer production.

RP: The Wikipedia entry describes commons-based peer production as a model of economic production "in which the creative energy of large numbers of people is coordinated (usually with the aid of the Internet) into large, meaningful projects, mostly without traditional hierarchical organisation or financial compensation." That sounds more like an Open Source project than Open Access perhaps?

LC: Actually, it is essentially what scholarly publishing is all about. We write something and then our peers critique it; and in this way we help each other out. That system worked well in the past, and then commercial publishers took over.

RP: Indeed, and it was the entry of commercial publishers into the scholarly publishing market that some believe triggered the serials crisis, and the whole problem of access that OA is seeking to resolve.

LC: Exactly, but in the new networked environment there is no reason why we cannot do more for ourselves, particularly with all the tools that are now available. This is where the Open Source part comes in.

RP: What sort of Open Source tools are you thinking about?

LC: A prime example would be EPrints. After all, EPrints is Open Source software, as is the other major repository software DSpace; and you could argue that if both these platforms hadn't been Open Source then repository software would not have spread as quickly as it has. Moreover, because they are Open Source they allow community input and local customisation.

Importantly, they are also available as free downloads. That makes a very big difference to paying some organisation thousands of dollars to allow you to create a repository. You can put it up quickly and run with it; and you have a community of users to whom you can go for support.

EPT, ELPUB, OASIS

RP: You are a trustee of the Electronic Publishing Trust for Development (EPT). Where does EPT fit into the scheme of things?

LC: EPT is another brainchild of Barbara Kirsop. Where Bioline is focused specifically on the electronic delivery of journals, EPT is more of an advocacy group and a think-tank — a loosely associated, distributed, group of people like myself, Barbara and Arun who are interested in the state of knowledge access in developing countries.

In Bangalore: D K Sahu (MedKnow Publications), Alma Swan (UK), Abel Packer (Brazil), Barbara Kirsop (UK), and Eve Gray (South Africa)

RP: You are also heavily involved in an annual conference on electronic publishing — ELPUB. What is ELPUB?

LC: When I tell people I am attending the ELPUB conference, they always think I am going to drink beer because "Pub" is involved! But ELPUB is short for Electronic Publishing.

RP: Is it a forum for discussing Open Access?

LC: Not specifically. ELPBUB is a long-running series that started 12 years ago. When I became involved about seven years ago ELPUB was fairly technical — a lot of the papers were about the technology end, or about coding, programs, and design and so forth.

But as I became more involved I introduced Open Access on to the agenda and in the last three or four years I would say that the conference has very much begun to focus on Open Access and alternative models of publishing. Nevertheless, the conference continues to provide a venue for broad technical and social discussions about the future of scholarly communications and the various sustainability models.

RP: You stressed earlier the importance of education if OA is to succeed. Your most recent project is something called the Open Access Scholarly Information Sourcebook [OASIS], which I think is an educational resource you are developing with OA colleague Alma Swan, and has been funded by OSI. When I asked Hagemann about it she said that Open Access is now growing so fast that it has become increasingly difficult for OA advocates like you and Swan to travel around giving all the presentations that are needed?

LC: [laughs] Yea! And I have been feeling increasingly guilty about the carbon footprint I generate from all that travelling!

RP: So OASIS will be an attempt to provide virtually what you have until now been providing in person?

LC: Not entirely. As you know, Alma and I travel all over the world to give workshops on Open Access. So we go and do these workshops, sometimes for a day or two, sometimes longer, and then we leave. But the problem is that after we leave there is no follow-up, because there are no sustainable local resources to push forward implementation, or somewhere local where people can go to ask questions, or get support.

So we thought it would be helpful to have something permanent online. We will still need to do workshops, but in future once we have given them we will be able to point people to OASIS, which will provide further guidance on the kinds of things that they can do. It will include an online checklist, for instance, and resources that local projects can use to follow up once we have left.

RP: It will cover all aspect of OA will it?

LC: Yes. The aim is to provide a set of walkthroughs. So when someone comes to the site it will ask them who they are. If, for instance, they say they are a researcher interested in making their research more accessible, and increasing their research impact, it will tell them what their options are. One of those options will be to publish in an Open Access journal, and it will explain what an Open Access journal is etc. It will also say that they can continue to publish in a regular subscription journal, but still make their research OA by self-archiving. It will then ask them if their institution has a repository. If they answer yes, it will tell them how to put their paper in that repository. If it doesn't, it will point them to a central repository.

RP: But it doesn't just cater for researchers?

LC: No. It's a self-guided walkthrough for different constituencies. There will be a set of walkthroughs for librarians, for instance, and a set for scholarly publishers and small scholarly society publishers. So if a publisher is interested in becoming Open Access it will tell them how to go about it, and the options available to them.

RP: And it is not targeted specifically at developing countries?

LC: No. It will be for all constituencies, or what we are calling communities. One of those community walkthroughs will be directed at the concerns of developing countries however. The idea is that we want to make this a very modular approach, so that if you are not interested in some of the issues you don't need to hear about.

RP: When will OASIS go live?

LC: It will be launched at the [ELPUB] meeting in Toronto in June (25th-27th), so we have been pretty busy getting it ready.

Luckily a lot of the information has already been written by one person or another. The problem at the moment is that that information is very, very scattered. Alma herself has written a lot material that we will include for instance.

RP: So it's primarily a case of aggregating information that already exists?

LC: Yes, pulling it all together in a useful way so that people can make the best use of it. We will also be asking for specific contributions from appropriate experts as well.

The idea is that we should not re-invent any wheels but find a way to share our common resources and experiences so that we can move ahead more quickly and efficiently. And given the fast pace of change, we don't expect the site to ever be completed. It will be a constant work in progress, as is the OA movement itself.

RP: How much is OSI providing for OASIS, and for how long?

LC: OSI is providing one year's funding, which will be around $60,000. That money will allow us to prepare a variety of new resources. One thing we are doing, for instance, is creating an online tutorial with [Les Carr] doing a live session on EPrints. We will then edit that session and break it up into modules, and link it to other resources. So if you wanted to run a local workshop you could use the videos and associated resources, and adapt them for your own local needs if you want to.

RP: Is it intended that it will eventually be self- financing?

LC: The plan is to use the seed funding from OSI for the first year. Then as we roll it out and begin to build up the content we will approach other agencies — Wellcome for example.

And since one of the components will be targeting developing countries we will approach organisations like the International Development Research Centre [[IDRC]] in Canada too.

RP: What is your role within OASIS?

LC: My role is to help in the design and project-management of OASIS. Alma and I are simply calling ourselves the co-ordinators, or editors, so you could think of it as an edited volume of which we are the two key editors.

Melissa Hagemann, Program Manager for Open Access Initiatives at the Open Society Institute (OSI); Dr. Zhang Xiaolin, Director of Library of Chinese Academy of Sciences, and Leslie Chan in Beijing, 2005

RP: Tell me: Is there much interest in OA in China today?

LC: China is a very large country and in the last few decades it has been investing heavily in science and technology, and in higher education — so the scientific output of the country, like its economic growth, is growing in leaps and bounds. And as many of the scientists and researchers working in China were trained in the West, many of them have heard about OA. This means that there are many pockets of interest in OA all across China as well. But the landscape is complex.

RP: And no mandates yet?

LC: Not yet. That is being curtailed somewhat by the big publishers. But China has decided to play the game differently to some of the smaller developing countries.

RP: How do you mean?

LC: The National Academy of Sciences and the big funding agencies have decided to play the West at its own game and beat it. If the name of the game is impact factors, they said, "then we'll have our scientists go out and publish by the truckload in order to gain high impact factors."

So they are very focused on making their journals more commercially oriented and internationally visible, and as part of that they are happy to work with Western publishers. Many of them, for instance, have now signed agreements with Elsevier, Wiley Blackwell, and Taylor & Francis.

RP: So China isn't likely to be found at the leading edge of Open Access any time soon?

LC: No. Although there is a dichotomy: A lot of the top-tier journals are now migrating to Western publishers in order to gain the impact factor, but you still have a huge number of smaller journals scattered across the country that are published by smaller scholarly societies. These journals are not getting international attention, but they are publishing good scientific work. So these are the people we need to target for OA.

Leslie Chan

Leslie and his student Stephen Tracy at the second phase of the World Summit on the Information Society, Tunis, Tunisia 2005

RP: Let's finish up by talking a bit more about you. To get a sense of who Leslie Chan is I've spoken to many people who know you — including the programme chair of ELPUB Susanna Mornati, Jean-

Claude Guédon, Alma Swan, Melissa Hagemann, Raym Crow, Heather Joseph, and Subbiah Arunachalam.

LC: [Laughs] Ok, you've been doing some background checks on me!

RP: Absolutely. But here's the odd thing: everyone who knows you loves and respects you! This was summed up by something Swan said: "Leslie is one of the world's nicest people, with a 'do good' gene being expressed in every cell of his body." Susanna Mornati clearly agrees. "It is a pleasure to spend time with Leslie," she told me, "he is brilliant and resourceful. He is sympathetic, keen to help and collaborate, and a qualified and experienced person, always modest, never arrogant." I wonder what kind of background such a popular person would come from. Tell me about your family?

LC: My parents came from communist China. In fact, my dad had to escape from China when he was in his early 30s, because he was the son of a landowner. He disappeared during the night after hearing that the communists were coming to hang him, leaving my mum and my elder brother behind.

After that my family suffered untold horrors, but survived and later went to Hong Kong as refugees, where they were reunited with my father. That's where I was born, and it is where my other brother and my sisters were born.

RP: When did your parents leave China?

LC: My dad fled China in 1949. My mom and my older brother left a few years later.

RP: Whereabouts in China did they live

LC: They lived in a coastal city named [Swatow](#), well known for its seafood and trading to other parts of South Asia, particularly Singapore.

RP: So your family were wealthy, but fell on hard times before you were born. It was tough when you were a kid was it?

LC: Well, we grew up what you would call a slum in Hong Kong. Really, it was a slum, and there were seven of us living in one small bedroom. So, yes, I knew what it was like to be very poor as I was growing up.

Fortunately my father was very hard working and he managed to get us out of poverty. There were all sorts of opportunities in Hong Kong, and I was also able to go to a very good school there, and so get an education.

RP: What occupation did your father take up in Hong Kong?

LC: My father took on a series of odd jobs, ending up working in a garment factory. Through his connections with China, he was able to start up his own garment factory in the 60s and became fairly well established by the late 70s.

RP: So your family was poor for a while, but managed to make the most of Hong Kong. And you got a good education as a result?

LC: Right. Also, Hong Kong is at the crossroads of the East and the West, and a very cosmopolitan city — so I was also lucky to gain a very broad view of the world. You get to see a lot of the world from Hong Kong, and my mother also always encouraged me to travel as I was growing up.

All in all, I would say that I am a lucky person; I have always had good fortune, and met new people, and very knowledge people at that. And I think I have been able to draw a lot of energy and goodwill from these people.

RP: And you emigrated to Canada to get a university education did you?

LC: Yes. From an early age my parents used to say to me: "When we get the chance we will send you abroad — because the Communists are coming"!

RP: But they sent you over on your own?

LC: At the time my family stayed in Hong Kong, and I came over on my own. Because of the impending return of Hong Kong to China it was common in the 70s for young people to leave Hong Kong to go overseas.

RP: And after arriving in Canada you married and settled?

LC: Yes, I married a local girl. We will be celebrating our 25th anniversary this year!

RP: You have children?

LC: We have a daughter, who is in her second year of university already. It's scary.

RP: Tell me more about your father's home in China?

LC: His family was very, very wealthy. Actually, I had an opportunity to visit the place where he lived a few years ago, and saw the remnants of the ancestral home. My father had told me how big it was, but I had never really believed it — until I saw the parameters of the old property, which had been turned into a school and a hospital. My family had owned a great deal of land and many buildings. That was why the communists came after my father.

RP: Are your parents still alive?

LC: My father passed away in 2002, but my mom is very well and turning 80 next year. Luckily for us she lives with us, and she makes sure we have fresh food and a variety of dishes and every day.

RP: You say there were seven of you in Hong Kong. You have two brothers and two sisters then?

LC: Yes, there were five children. So with my parents there were seven people living in one room when I was a kid.

RP: Where are your siblings today?

LC: My younger brother is a senior police Superintendent in Hong Kong. [laughs] He's in charge of the Olympic security for all the horse events in Hong Kong, so if you need a pass to that...

My older sister is a business person and works in China.

RP: She didn't emigrate to the West like you?

LC: Well, like many people just before Hong Kong was returned to China she and her husband initially migrated to Toronto. But they then discovered that all the opportunities were back in Hong Kong and China. So they moved back and set up a business, and they both now work in China. And they have been very successful.

RP: Barbara Kirsop tells me that your younger sister runs an orphanage in China.

LC: Yes. She is just amazing. She single-handedly started up an orphanage in [Nanning] in [Guangxi province] of China in 1995, and then convinced the local government and mayor's wife to give her an old decrepit hospital in which to house it. At one point it got pretty big. Then, because my sister is so good at public education — stressing the importance of contraception and of not abandoning girls and so on — there were suddenly far fewer babies being abandoned, so she was able to scale back the orphanage, and move into other areas too.

RP: Such as?

LC: One of the things she is doing now is working on HIV/AIDS in remote areas of Western China. A lot of people there were infected with HIV/AIDS as a result of blood transfusions.

RP: Melissa Hagemann tells me that when she went out to Hong Kong with you, you invited her to a party with your extended family. She was very touched that by that, especially as you don't see your family very often nowadays.

LC: Yes. That was fun.

RP: Susanna Mornati said to me, "Leslie comes from Hong Kong and still retains a natural eastern gentleness [but he] has over the years also become a perfect open and informal North American". Your commitment to helping developing countries grew naturally from your background I guess?

LC: Oh, yes. China is very, very close to home for me, and many people forget that it is a developing country. But anyone who has travelled into the interior of China will know how much of the country is desperately poor.

RP: This means that although you are based in North America, you take a much broader view than many OA advocates.

LC: I think so. I constantly remind my students that we are citizens of the world and we need to act locally but think globally.

RP: I'm thinking, for instance, about how your views would contrast with those of Harnad's. If anyone raises developing issues in connection with Open Access Stevan tends to wave his hands and say: "First things first, let's focus on achieving Open Access in the West, and then worry about the rest of it." You, however, are primarily focused on the needs of the developing world?

LC: Right, I start from the vantage point of developing countries because three quarters of humanity today lives in so-called developing countries. I want to use Western institutions as leverage. After all, we in the West have the resources, so I want to see some of those resources used for the benefit of the developing world.

RP: What is also distinctive about you is that, unlike many in the OA movement, you adopt a very low profile.

LC: [Laughs] And I would like to keep it that way.

RP: Nevertheless, you have clearly been very effective working in the background. While others have been content to sit at home shouting the odds on mailing lists, you have been buzzing around the world giving presentations on Open Access ,and providing practical assistance.

LC: Well we talked earlier about the large subscription packages sold by Elsevier that people call the "Big Deal". I always call Bioline the Small Deal. And I like to remind people that if we can create enough of these small deals, we will become a very big deal [laughs].

RP: Let's look at some of your small deals then. Arunachalam said to me, "Leslie is a true friend of the developing world. I invited him and Barbara Kirsop way back in 2001 to conduct two three-day workshops on electronic publishing. He far exceeded my expectations. During the week we trained about 50 people from different parts of India. One of the trainees, [Dr D K Sahu](), turned out to be a gem. He runs a company called [MedKnow Publications]() and publishes more than 50 OA journals on behalf of societies and educational institutions. Most of them are Indian journals but a few are from other countries."

From left to right: the late T.B. Rajashekar, founder of the EPrints repository at Indian Institute of Science, Bangalore, DK Sahu (publishers of MedKnow Publishing), Leslie Chan, Les Carr (University of Southampton).

Arunachalam added, "Again I invited Leslie in 2004 for two three-day workshops on Open Access repositories. This time he came along with [Leslie Carr]() of Southampton University. The two Leslies did a wonderful job and gave training to 48 people. Several of the trainees went on to set up institutional repositories — among them [Sukhdev Singh]() of the [National Information Centre](), [Madhan Muthu]() of the [National Institute of Technology, Rourkela](), and others from the [National Chemical Laboratory, Pune]()."

The image that comes to my mind is that of throwing pebbles into the water. Leslie Chan visits India to give a presentation, and throws a pebble in the water. When he leaves the ripples keep on spreading. I understand your point about the need to provide a service like OASIS, but it seems that you are able to fire some people's imaginations, and energise them to then go off and do very practical things themselves — like start an Open Access journal, or set up an institutional repository.

LC: We have learned from Bioline, and from many of our dedicated partners, that there is much that remains to be done in terms of access to knowledge, and I would much rather spend my energies producing tangible results, even if it means creating Open Access one article at a time. It all adds up in the end. We should not underestimate our collective power.

At the same time, it is important to get our message out at some higher levels. One of the things I was very pleased to be involved in was the World Summit on the Information Society.

RP: Which was not particularly receptive to OA initially was it?

LC: That's right. OA was initially ignored at the world summit, because even though the focus is on development, most of the attention went to things like ICT and development aid. But we went along and lobbied hard amongst different development communities to try and get them to pay attention to OA as a key to development. It was a huge task, but we just plugged away — and eventually a number of OA events were included in the World summit.

Since then we have been able to get OA on the agenda of follow-up events to WSIS. One was for the Global Knowledge Partnership, and one took place in Kuala Lumpur last December, where we were able to get two or three OA events into the programme.

So we were able to plant some OA seeds within the development community, which did not traditionally think of it as being a concern for them.

RP: Another example Arunachalam gave me of your behind-the-scenes activity was the role you played in getting an OA policy introduced at The International Development Research Centre (IDRC). Arunachalam had been trying to persuade the IDRC to do this for some time, and then one day you came along and, as he put it, "clinched the deal". Not only did you show yourself to be a great negotiator, but it turned out that you had been at college with the IDRC vice president Rohinton Medhora!

LC: That was an interesting experience. The IDRC had invited Stevan Harnad to give them a talk as well. Stevan being Stevan was very focused on his view of what an institutional repository is. And, as you will be able to imagine, he was somewhat directive in his approach. It ended up that a lot of people began saying, "Why is this guy coming in and telling us what to do."

So I took a very different approach, and talked about a number of success stories from different parts of the world. Then I tugged on the ethical aspects of IDRC's mission. I said, "If you fund all this research but none of it ends up being available to the research community that you say you want to help then are you really doing your job properly?" I think that message really got through to many of the programme managers.

Why?

RP: Another picture of you that emerges is of someone who is very focused and determined, but rather isolated. You have to do most of your advocacy your own, and so presumably have to mainly motivate yourself. Joseph put it like this, "One thing that people don't realise about Leslie, and which is really very impressive, is that while he is a ubiquitous presence at conferences, and at meetings, he doesn't have an organisation like SPARC behind him supporting his OA activities." I guess it must feel particularly lonely in light of the huge problem you face right now finding new funding for Bioline?

LC: It's not a new experience! I met Heather when she was executive director of BioOne, and even back then Bioline was on a life-support system, as it has been from day one. I used to say to her, "We are on a life support system so it is hard for us to think big, and develop grand marketing ideas and business models." But Heather was always very sympathetic from the beginning.

RP: BioOne is an initiative of SPARC and similar to Bioline, but subscription-based rather than OA. Essentially, the aim is to provide an electronic platform for small non-profit scholarly publishers who don't have the capital to do it themselves. As such it doesn't focus on the developing world.

LC: Correct. So yes, I am especially grateful to Heather because she is now assisting us to develop a business model. It's less lonely with her and Raym out there!

Leslie and Ruth Oniang'o, Editor-in-Chief of African Journal of Food, Agriculture, Nutrition and Development, a journal partner of Bioline International, Nairobi, Kenya, 2006

RP: Given the somewhat lonely furrow you have to plough, Heather Joseph said she was particularly curious about your motivation. As she put it, "I am always interested in what motivates people to get involved, to be out there advocating for change even when faced with a lot of pushback, and Leslie does it without a huge machine behind him, or even an organisation that says: 'This is your mission, this is your cause'." As Heather puts it, "How do you find the inner resources to just keep going on this stuff"?

LC: What really motivates me is that I believe we are doing the right thing. Recently while attending a meeting in Shanghai, I ran into one of the editors of *African Crop Science* — a journal based at Makerere University in Uganda. *African Crop Science* was one of the earliest journals to join Bioline, but the editorial board decided to leave in 2004 as the journal did not want to go OA.

RP: Why?

LC: Oh, the usual fear of lost subscription and misconceptions about OA, such as lost of editorial control and lower quality.

But after a four years hiatus from Bioline, the editorial board of the journal has decided to reconsider joining Bioline because they are seeing the benefits other African journals are enjoying as a result of OA. This is the kind of small victory that convinces me that we are on the right track and, again, if we have to convince one journal at a time, so be it.

It also helps motive me that people laughed at us! It wasn't just big publishers who used to laugh: I had senior colleagues laugh at me too. "You are wasting your time, you are going to kill your own career," they said. "It is just not worth doing."

So that also helped motivate me. When people say you can't do something, and that it won't happen, or is a waste of time, I usually want to prove them wrong!

RP: I wonder if you ever considered giving up your academic career to spend more time on OA, in the way that Peter Suber did?

LC: Interestingly, as we have been developing a business model for Bioline it has occurred to me that there must be lots of organisations out there today that are working through these same issues, and how we now have a lot of practical experience of them. Assuming that in a year or so we were able to see our business model starting to work I could see I might have something to offer others.

RP: So you might spread your wings?

LC: Yea, it's crossed my mind that I could quit my job here and start up an OA coalition offering my services to other organisations looking to do a similar sort of thing. However, I would probably miss the classroom and student mentorship too much. Students are the hope for the future, and the next generation of foot soldiers for OA, and much remains to be done on that front.

RP: I wonder if there is some sadness for you in living miles away from your siblings, particularly at a time when China is rapidly becoming the economic powerhouse of the world (and very important politically). Would you like to go back yourself?

LC: Well I just returned from a trip to Shanghai in May. There was a big conference that took place as part of the preparation for the World Expo, which will be held in Shanghai in 2010. There was a scientific component to the May event, and as part of that there was a meeting on Digital Knowledge Resources and Infrastructure organised by the Interacademy Panel and the Global Alliance for Enhancing Access to and Application of Scientific Data in Developing Countries.

RP: Here's my final question then: When they write the history of Open Access how would you like to see your role described?

LC: I would like to be seen as this guy who plugged away at the small deals, and wouldn't give up.

RP: Ok, let it be so! It's been great speaking with you, and I wish you the very best of luck with Bioline.

Chan flies off with Air Botswana

inspired to contribute would be fine. This can be done quite simply by sending a payment to my PayPal account quoting the email address *richard.poynder@btinternet.com*. It is not necessary to have a PayPal account to make a payment.