FREEDOM FOR SCHOLARSHIP IN THE INTERNET AGE

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Chapter 1: Introduction

> *An old tradition and a new technology have converged to make possible an unprecedented public good. The old tradition is the willingness of scientists and scholars to publish the fruits of their research in scholarly journals without payment, for the sake of inquiry and knowledge. The new technology is the internet. The public good they make possible is the world-wide electronic distribution of the peer-reviewed journal literature and completely free and unrestricted access to it by all scientists, scholars, teachers, students, and other curious minds. Removing access barriers to this literature will accelerate research, enrich education, share the learning of the rich with the poor and the poor with the rich, make this literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge* [1].

This paragraph, from the Budapest Open Access Initiative, beautifully expresses an immanent liberating potential for scholarly communication facilitated by the internet. This is a vision that I share with my colleagues in the open access movement. The central challenge for achieving this vision is overcoming the equally immanent potential for increasing enclosure and commodification of scholarly communication that is inherent in capitalist society and can be assisted by the electronic medium, for example through digital rights management.

Struggle between these opposing tendencies at the present time is intense. The following examples are only two among many, included here for illustration purposes only. As of early 2011, the Canadian Access Copyright collective is seeking a multifold increase for rents for copyrighted material, and at the same time a decrease in rights to use these materials, including the rather odd assertion that linking to paid-for electronic resources cannot be considered part of normal usage[2]. Meanwhile, the Public Knowledge

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[1] *Budapest Open Access Initiative*, February 14, 2002. Retrieved Feb. 26, 2011 from http://www.soros.org/openaccess/read.shtml

[2] See *Access Copyright Interim Post-Secondary Educational Institution Tariff, 2011-2013, Resources*. Retrieved Feb. 26, 2011 from http://www.accesscopyright.ca/, for the

Project has developed free, open source software for journals management (Open Journals System), currently used by thousands of journals around the world, with almost all being fully open access or freely available after a delay period[3].

Another broader way to view the struggle is that of contest between the exceptionally profitable multi-billion dollar scholarly publishing industry seeking maximum extraction of profits, and the scholarly gift economy that characterizes the vast majority of the creation and use of scholarly communication today.

Once the *excessive* profits are factored out, there is more than enough money in the system to fund a fully open access scholarly communication system, with access to the world's scholarly knowledge freely available to anyone, anywhere with an internet connection. The challenge is to overcome the considerable inertia of the existing system, which, through an inelastic market, sucks up all available funds through highly constraining and often multi-year academic library licenses. Academic traditions such as tenure and promotion committees' emphasis on journal impact factors can present formidable obstacles to change. While many scholars and activists have been working in this area over the past few years, a great many research questions remain unanswered[4].

The purpose of this thesis is to further the work of transitioning to an open access scholarly communication system designed to support and prioritize scholarship and the

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Access Copyright perspective. For dissenting opinion, see the Canadian Association of Research Libraries' CARL *Supports the AUCC in its Objection to the Proposed Access Copyright Post-Secondary Education Tariff 2011-2013*. Retrieved Feb. 26, 2011 from http://www.carl-abrc.ca/new/new-e.html

[3] *OJS Journal User Numbers*, retrieved February 26, 2011 from http://pkp.sfu.ca/ojs-user-numbers.

[4] For example, see the Research Questions section of the *Open Access Directory*, retrieved Feb. 26, 2011 from http://oad.simmons.edu/oadwiki/Research_questions, a section that I contribute to on a regular basis.

public good rather than profit. The method will involve analysis of key underlying historical trends in society and how they impact scholarly communication, as well as original empirical work on the growth of open access, theoretical analysis of the intersection between open access and Creative Commons, economic analysis to inform economic aspects of transition, and a case study of scholarly communication in the discipline of communication.

The first section will situate scholarly communication within the broader context of the trends toward commodification and rationalization in western society in general and in the university context in particular. Selected alternatives to commodification and rationalization will be briefly explored.

The next section will feature an overview of open access, including in-depth definitions and articulation of sub-types and related movements, and major open access initiatives. This will be followed by original empirical work on *The Dramatic Growth of Open Access*, an often-quoted Informal study that I have been working on since at least 2004[5].

One chapter will focus on a macro economic view of scholarly communication that will articulate the potential for transition from an economic perspective, supplementing early major studies that have been conducted in this area[6].

A case study of scholarly communication in the discipline of communication will be presented, taking into account the current system of scholarly publishing, and

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[5] Available through my scholarly blog, *The Imaginary Journal of Poetic Economics*, retrieved Feb. 26, 2011 from http://poeticeconomics.blogspot.com/2006/08/dramatic-growth-of-open-access-series.html

[6] For example, see Houghton et al.

exploring the potential for liberation of communication scholarship to prioritize scholarship rather than commodification.

Finally, the conclusion will highlight original contributions of this thesis and make recommendations to further transition of scholarly communication towards a global open access system.

This thesis emerges from a confluence of my volunteer work over the past few years as an open access activist and theoretical studies through the School of Communication. Examples of previous work can be found through my scholarly blog, *The Imaginary Journal of Poetic Economics* http://poeticeconomics.blogspot.com, and previous publications and presentations, most notably my book, *Scholarly Communication for Librarians* (Oxford: Chandos, 2009).

Chapter 2: Scholarly Communication in Crisis

In the September 2011 issue of *Action Research*, Tara Leigh F. McHugh of the University of Alberta and Kent C. Kowalski of the University of Saskatchewan published an article called "'A new view of body image': A school-based participatory action research project with young Aboriginal women".

When faculty or students at either the University of Alberta or the University of Saskatchewan wish to view articles in this Sage-owned publication, access is as simple as going to the journal from a computer authenticated for university access, reading the abstract for free, and clicking on PDF to immediately download the full-text of the article.

Whenever anyone not associated with a subscribing institution tries to access the article, the abstract is still free. However, to access the full text in PDF form, the potential reader is given two options: a) to subscribe to the journal – at rates varying from $91 US for an individual subscription to $719-$799 US for an institutional subscription or b) "purchase short term access: Pay per Article - You may access **this article** (from the computer you are currently using) for 1 day for US $25.00". (Sage Journals Online, 2011).

In other words, students and faculty at wealthy universities in the developed world have ready access to the results of this research, while for almost everyone outside of these institutions, the cost is a significant, if not insurmountable, barrier. A young aboriginal woman using a school computer or public access terminal at a public library, wishing to see the results of this research would be invited to pay $25 for one-time access, for one day, at one computer. School, public, and most government libraries cannot afford access to academic journal subscriptions in the $700 a year range, and so

this article is practically inaccessible to teachers, parents, social workers, and government officials even in wealthy regions like Western Canada.

Taking advantage of the access I have through my own university, I can see in the acknowledgements that this research was conducted by doctoral students with support from two of Canada's research councils, the Canadian Institutes of Health Research and the Social Sciences and Humanities Research Council. The list of people who are invited to pay-per-article at $25 includes the taxpayers who fund the research councils and a significant portion of the university budgets, as well as the staff at the research councils. Outside the wealthy west, the economic barrier looms even larger.

It is ironic that participatory action research results are reported in a manner that is inaccessible to participants, those who are motivated to help the participants take action towards better lives, and those who funded the research. This is not the exception, but rather the norm in scholarship today. Scholars and those who fund them generally aim to extend the collective knowledge of humankind and to solve problems, then frequently freely hand over the results to a system designed to maximize profit. The remainder of this chapter will provide a brief overview of scholarly publishing, situate the scholarly publishing system within overall trends towards commodification and rationalization, and sketch out a few potential alternatives identified to date.

Scholarly Communication: A Brief Overview

From the perspective of the scholar-author, the scholarly communication system is largely a gift economy. Funded through university salaries and research grants, scholars give away their journal articles and provide peer review, and often editing as well, for free. This gifting of labour and the results of labour is conducted, not for

monetary exchange but rather as a means of contributing to the collective conversation of scholars in a given field (and hence earning tenure and promotion). The result is a well of knowledge from which all draw as well as contribute. Royalties are common for scholarly monographs, and so scholars are likely to see monographs as a source of financial rewards rather than as a pure gift economy. Whether the sums involved really make sense as a financial incentive seems doubtful, given the small number of copies of scholarly monographs typically produced today. The scholarly communication system on the surface is free to the scholar in the developed world as reader. The journals and books are supplied by the library in a manner that conceals the underlying financial transactions between libraries, publishers, and suppliers.

The mission of the traditional scholarly society publisher is generally aligned with the gift economy. The purposes of a typical society are to serve scholarship, and often society in a broader sense. If there is a surplus of funds from publishing, this is used to fund other activities that are useful to scholarship, such as subsidizing conferences, educational activities, or graduate scholarships. Up until the end of the Second World War, the vast majority of scholarly journals were published by the not-for-profit sector. Mabe (2003, p. 194) characterizes the period from 1900 to 1940 as one in which almost all scholarly publishing was in the hands of the scholarly societies.

In the decades since the Second World War, there has been a steady increase in involvement by the commercial sector in scholarly publishing. At the same time, growth in the number of scholarly journals was exponential. This was not a new phenomenon. Research on the growth of scholarly journals over the centuries has noted a remarkably constant exponential growth rate of scholarly journals since the 1600's (De Solla Price,

1963, p. 17), with just a slight increase in the decades immediately after World War II (Mabe and Amin (2001), Mabe, 2003). Mabe (2003) calculates the average annual scholarly journal growth rate at 3.46% per year from the 1600's to the present day, with an increase to 4.35% from 1946 to 1976 and subsequent fall to 3.26% after 1976.

In the decades since the Second World War, there has been increasing involvement by the commercial sector in scholarly publishing and increasing concentration in the market, so that today a very substantial percentage of the world's estimated 20-25,000 scholarly peer-reviewed journals are published by just four companies: Reed Elsevier, Springer, Wiley, and Informa.plc (also known as Taylor and Francis) (Crow, 2006). Three of these companies (Reed Elsevier, Wiley, and Informa.plc) are publicly traded corporations, while Springer is owned by private equity firms.

All are in the for-profit sector, and the profits are enormous. As reported in the Economist (2011): " Elsevier, the biggest publisher of journals with almost 2,000 titles, cruised through the recession. Last year it made £724m ($1.1 billion) on revenues of £2 billion—an operating-profit margin of 36%". Springer's Science + Business Media (2010) reported a return on sales (operating profit) of 33.9% or € 294 million on revenue of € 866 million, an increase of 4% over the profit of the previous year. In the first quarter of 2012, John Wiley & Sons (2011) reported profit of $106 million for their scientific, medical, technical and scholarly division on revenue of $253 million, a profit rate of 42%. This represents an increase in the profit rate of 13% over the previous year. The operating profit rate for the academic division of Informa.plc (2011a, p. 4) for the first half of 2011 was 32.4%, or £47 million on revenue of £145 million, an increase of 3.3% over the profit of the previous year.

The U.K. Office of Fair Trading (2002, p. 12) noted that the profitability of commercial science, technology and medicine (STM) publishing was high, not only in comparison with not-for-profit publishers, but also in comparison with other commercial publishers, and that there would be substantial savings for customers if these publishers were to charge average profit rates.

The above-average profits of these large commercial publishers contrast with the present financial situation of universities and the academics who give these publishers their works and services. For example, in the U.S., the Association of American Universities (n.d.) has a website section reflecting the 2008 financial crisis, called *Universities address the economic recession*, which states that "many have taken such actions as furloughs or hiring freezes, pay cuts for senior administrators, and delays of capital projects".

McMillan (2011) comments on discussions at the University of California system in May of 2011, where after three years of furloughs, layoffs, student fee increases and program cuts, the budget was predicted to include a further $500 million in cuts. The American Association of University Professors has a list of "Financial Crisis FAQs" on their website, which states that the current challenging financial situation is being used to justify a number of measures that impact on academics, including "hiring and salary freezes, furloughs, salary cuts, layoffs, nonrenewals, reduction and elimination of academic programs and colleges, revision of curricula, changes in academic policy, elimination of tenure, substantial changes in workload, and more".

Prosser (2011, p. 60) notes the 'brutal' cuts to the U.K. higher education sector, including an announcement that over the next few years the state would withdraw altogether from funding teaching in the humanities and social sciences.

The effects of the global financial crisis are being felt to varying degrees everywhere. In 2010, the International Coalition of Library Consortia (ICOLC) reissued its *Statement on the Global Economic Crisis*, reiterating anticipation of long-term cuts to budgets for libraries and library consortia and a call to publishers for restraint on pricing increases.

This is an *inelastic market*; changes in the abilities of customers to pay have little or no impact. There is no competition in the system, as noted by the U.K. Office of Fair Trading (2002) and the European Commission (2006), among others. One cannot substitute a cheap article on one topic for an expensive one in a must-have science journal that a researcher is depending on for research needed to obtain grants. If the only goal of scholarly communication were profits, this would be a healthy system.

However, from the perspective of serving scholarship, this system leaves much to be desired. The serials crisis has been well documented elsewhere (Association of Research Libraries, 1989), and will not be covered here in detail. In brief, the prices of journals, particularly in the science, technology and medical (STM) areas have been increasing at rates far above inflation over a period of decades, with the result that not even the largest research libraries can afford comprehensive collections anymore, resulting in a loss of access to the scholarly literature for research. The crisis is ongoing, as illustrated by the Research Libraries UK (2010) call to publishers for pricing restraint,

stating that if prices are not reduced, some of the largest universities in the UK will need to cancel the 'big deals' of some of these journal publishers.

An open letter from the National Science Library of the Chinese Academy of Sciences (2010) illustrates that the crisis is global in scope. If current trends continue, the effects will be particularly strong in the developing world. The National Science Library letter says, "To our dismay and anger, a few international STM publishers, using their monopolistic position, recently demand to raise the subscription prices for their full-text database at a yearly rate of more than 14% for the next 3 years", and by 2020, to raise the prices for developing countries to the level of those of the developed countries.

While the for-profit sector has taken over a substantial portion of scholarly publishing, particularly journal publishing, there remains a mixed market of not-for-profit society and learned journal publishers and university presses, which are still involved in publishing over half of the world's scholarly journals (Crow 2006, p. 1). This sector maintains a close affiliation with the mission of scholarship, and their journals are typically more cost-effective. For example, Bergstrom and Bergstrom (2006, n.p.) conducted a study comparing journal costs across a range of disciplines, concluding:

> For example, in the fields of economics and ecology, the average institutional subscription *price per page* charged by commercial journals is about 5 times that charged by non-profit journals. These price differences do not reflect differences in quality as measured by number of recorded citations to a journal. For commercial journals the average *price per citation* is about 15 times that for non-profit journals. Similar price differentials are found across a wide variety of scientific disciplines.

The trend toward commercialization and consolidation in scholarly publishing was particularly acute in the early days of the transition to an online environment, roughly the 1990's, as smaller and not-for-profit publishers did not have the resources to compete with the larger publishers. Today more affordable options are available, opening up the potential for a more competitive environment for smaller publishers, and, arguably, a renaissance of scholar-led publishing (Edgar and Willinsky, 2010).

While the profits of a few commercial STM journal publishers have grown to above average rates in recent decades and continue to grow even at a time of global financial crisis, other areas of scholarly publishing have experienced decline. Thompson (2005, p. 63) documents how the rise of powerful commercial players in STM has "squeezed the budgets of university libraries with dire consequences for academic publishers…". In the 1970's, a scholarly monograph publisher would typically print 4 – 5,000 copies of a hardback; by 2005, due to declining sales of monographs, this figure was reduced about tenfold, to about 400-500 copies (Thompson 2005, p. 93-4). One result of declining sales is that some disciplines or subdisciplines are less attractive to scholarly monograph publishers. Many scholarly monograph publishers are aiming to survive by moving into other areas such as textbook or trade publishing (Thompson 1980, p. 139).

Brown (2010) explains the dilemma of the university press in the U.S., perceived as outside of the core mission of the university, subsidized for the common good, receiving little by way of attention, opportunities to participate in planning, and resources. When the press is successful, subsidies are cut back. When the press runs a

deficit, it is expected to cut back. Yet, Brown notes how the university press can balance a scholarly mission with profit in a way that the commercial press cannot. The university press is more likely to publish important scholarship that may not be of value in a commercial sense. As Thompson (2005, p. 17) notes, young academics need to publish specialist knowledge, while publishers are looking for books with broad appeal. In this sense, the ultimate goals of universities and the commercial sector may clash – for example, the university has a stake in looking for more cost-efficient ways of publishing to enable publication of more scholarship and new formats, while the focus of the commercial publisher is to maximize revenue.

Harley, Acord, Earl-Novell, Lawrence, and King (2010, p. xiv) express concerns about a monograph crisis which may be driving scholars in specialized subfields toward more readily marketable areas of scholarship, and making it difficult for scholars to publish in areas deemed by university presses to be less commercially viable. Withey, Cohn, Faran, Jensen, Kiely, & Underwood 2011, p. 3) note that the crisis of monograph publishing threatens many of the intellectual characteristics most valued by the scholarly enterprise itself: concentration, analysis, and deep expertise.

To summarize, scholarly publishing today is characterized by a small number of STM journal publishers enjoying above average profits in an inelastic market that reaps growing profit margins even at a time of severe cutbacks for the universities where most of the content sold by these publishers is written, reviewed and read by academics, at no cost to the publishers. Scholars and their university libraries are challenged by high and increasing prices and resulting loss of access to needed works. Meanwhile, other areas such as monograph publishing are experiencing crisis due to declining sales as an

increasing share of library budgets go to the packages of the STM journal publishers. There are profound impacts of this system that undermines the ability of scholars in some specialties to publish their work, especially if the work is of extended length.

Productivity, or capture of science & scholarship by expanding capitalism

Marx noted how the key to capitalist production:

> is not merely the production of commodities, it is, by its very essence, the production of surplus-value…The only worker who is productive is one who produces surplus-value for the capitalist, or in other words contributes toward the self-valorization of capital. If we may take an example from outside the sphere of material production, a schoolmaster is a productive worker when, in addition to belabouring the heads of his pupils, he works himself into the ground to enrich the owner of the school. Marx (1976, p. 644)

De Solla Price describes a break between the period of 'Little Science', before the Second World War, and 'Big Science', after the war. According to De Solla Price, "…the most abnormal thing in this age of Big Science is money" (1963, p. 92). While the number of scientists was doubling every 10-15 years at that time, in constant dollars, expenditures on science were doubling every 5 ½ years, so that the cost *per scientist* was doubling every 10 years. De Solla Price calculated that the cost of science was "increasing as the square of the number of scientists" (p. 92). De Solla Price asks, if the first half of the century belonged to the lone, long-haired genius scientist, whether the period after World War II belonged to the scientist "honored in Washington, sought after by all the research corporations of the "Boston ring road," part of an elite intellectual

brotherhood of co-workers, arbiters of political as well as technological destiny"? (1963, p. 3).

Mandel (1980) has noted a likely reason for this expansion in investment in science: an inherent tendency of capitalism to continuously expand into new spheres. Mandel talks about rents from technological innovation becoming the main source of monopolistic surplus under what he calls "late capitalism". Invention, according to Mandel, " becomes a branch of business" only in late capitalism (Mandel 1980, p. 249). Technological innovation from a traditional Marxist perspective was a key driver of surplus profits or unusually high profit rates, generally short-lived until competitors catch up with the new technology.

Polanyi (1957) argues that one distinguishing feature of the market economy from all other economies is that it subsumes society. Prior to the emergence of the market economy, all societies had economic aspects, and many had markets, however markets and economy were subservient to other social relationships and needs. Labour is one of what Polanyi describes as the three fictitious commodities of the market economy, along with land and money. It is the transformation of labour and land, human society and the means of production, into commodities that creates the conditions that subsume human society and the earth itself into the economy.

Knowledge as property: the creation of a fictitious commodity

Today, we need to add to Polanyi's list a fourth fictitious commodity: knowledge. The short-term nature of high profit rates from technological innovation is based on the classic notion that knowledge is a perfect public good, nonrivalrous in nature (if someone else knows what I know, this does not diminish my knowledge) and nonexcludable (Hess

and Ostrom (2007, p. 8) and Drahos and Braithwaite (2002, p. 215), among others. However, while knowledge in intangible form is nonexcludable, the *tangible* forms of knowledge, whether as books, scholarly journals, or bytes, *are* excludable. And exclusion is a temptation:

> From the point of view of individual profit making, knowledge is the ideal object of propertization since it is non-rivalrous in supply. The same knowledge can be endlessly recycled to many generations of consumers, each new generation having to pay for its use. The incentives for individuals to seek profit through a redefinition of the intellectual property rules that form the basis of the knowledge economy are great (Drahos & Braithwaite 2002, p. 216).

The invention of "intellectual property": enclosure of knowledge

The term "intellectual property" is relatively new, having entered into popular discourse only in the 1970's (Vaidhyanathan 2004). The purpose of intellectual property, according to Vaidhyanathan (p. 87), is to create artificial scarcity.

Boyle (2003, p. 12) refers to a second enclosure movement, of the "intangible commons of the mind". Hess and Ostrom (2007) situate the enclosure of knowledge within a broader context of new technologies which have made resources which were once open enclosable; not just knowledge, but also the deep seas, the electromagnetic spectrum, and outer space. While there is some truth to the statement that new technologies have enabled new enclosures, it would be more accurate to state that human beings have developed and/or shaped technologies in order to enable new enclosures. Feenberg (1992, 2002) and Bijker, Hughes and Pinch (1987) explain how technology is socially created. Numerous examples and cases study are provided by these authors. One

such is Feenberg's argument that sidewalk curbs are not immanent to sidewalk technology, but rather were developed as a result of concerted struggles by disabled persons. This is important to understand when examining scholarly communication. For example, while digital rights management (DRM) is a technological tool, it is one that was developed specifically to artificially create new forms of enclosure.

Mosco (1989) counters the common viewpoint that Information technology is changing the world. His view is that we are witnessing a "pay-per" society that reflects ever-increasing commodification, and is part of an overall transition from feudalism to capitalism. The ability of Information to permit "pay-per" (call, bit, etc.) makes possible an intensification of commodification.

Drahos and Braithwaite (2002) situate the gradual enclosure of Information through intellectual property rights within their concept of an incomplete project of Information feudalism, a movement away from capitalism. Superficially, Drahos and Braithwaite's Information feudalism is very similar to Mosco's pay-per society, however it is interesting to note that their overall visions of the implications are very different. While Mosco's pay-per society is an intensification of capitalism, Drahos and Braithwaite present Information feudalism as a *threat* to capitalism; for example, they state: "Ironically, Information feudalism, by dismantling the publicness of knowledge, will eventually rob the knowledge economy of much of its productivity." (Drahos and Braithwaite 2002, p. 219).

Elsewhere, I have written about the potential impact of usage statistics (basically the pay-per model) on scholarly communication (Morrison, 2005). One concern is that usage-based pricing inevitably tends to discourage use. If every download of an article

incurs a cost, it will be tempting for universities with limited funds to implement reading limits for undergraduates, discourage research assignments, or refuse to provide service to walk-in users. Another concern is that it is likely that researchers will find it difficult to publish in less popular fields, regardless of importance. For example, while the importance of the environment is broadly understood in our society, the potential readership of scholarly literature on any one of the species under threat of extinction will be limited (excluding the famous and cute species such as whales as koala bears). Since academics need to publish in order to work, this could impact what subjects are studied. Harley et al. (2010, p. xiv) note "concerns that publication challenges in specialized subfields [of history] may be driving scholars toward more readily marketable areas of scholarship".

Scholarly publishing and the enclosure of knowledge

The non-scholarly content industries (music, movies, etc.) "have been clear about their intentions to charge for every bit of data…and crush libraries by extinguishing fair use" (Vaidhyanathan 2004, p. 53). Some people and companies in the scholarly publishing industry are also working to enforce the enclosure of knowledge. Van Leeuwen (1980, p. 266) notes that the common interests of international scientific publishers in fighting copyright policy was the chief purpose of a resolution proposed by Robert Maxwell of Pergamon Press in July 1968 at the International Publishers' Association which was the start of the International Association of Scientific, Technical and Medical Publishers (STM).

Copyright and legal affairs remain key issue areas for STM. For example, STM's CEO Michael Mabe, in a submission from STM to a consultation on the European

Institute of Innovation and Technology, Mabe (2011, p. 2-3), argues that publishers require *exclusive* copyright so that the substantial investments they make in scholarly communication can be recovered, ostensibly to serve the public interest. Mabe does not address the question of how best to ensure that the public which provides the funding for most academic research, the authors, peer reviewers and research participants benefit from the results of the research. Giving exclusive copyright to any one party is arguably a disservice to all of the other parties who contributed to the research, or for whom it was conducted.

Two consequences of the movement of capital into the sphere of science are outlined by Mandel. The first is the growth of scientific intellectual labour, reflected in an explosion in universities after World War and in the proletarianization of intellectual labour. That is, "the more higher education becomes a qualification for specific labour processes, the more intellectual labour becomes proletarianized, in other words transformed into a commodity…", and the more the price of this commodity tends to be forced down to its conditions of reproduction (Mandel 1980, p. 263).

The creation and popularity of the *Edufactory* group and journal, connecting activists within universities worldwide who are protesting growing proletarian conditions, supports Mandel's prediction. The Edufactory Manifesto (2008) begins **"**As once was the factory, so now is the university". Some scientists may be celebrated and influential in Washington and the Boston Ring Road as De Solla Price claims. But, today, typical science graduates are far more likely to be chasing down ever more elusive and precarious academic positions while simultaneously attempting to pay down mounds of unforgivable debt. For example, Cauchon (2011), quoting the Federal Reserve Bank of

New York, the U.S. Department of Education and private sources notes that student debt in the U.S. is anticipated to hit the trillion dollar mark before the end of 2011 – debt that can't be shed in bankruptcy. Cauchon notes that "the credit risk falls on young people who will start adult life deeper in debt, a burden that could place a drag on the economy in the future".

> Brophy (2011, n.p.) explains the situation for today's graduate students thus:
>
> Graduate students, faced with diminishing prospects of a secure job in the academy are increasingly confronted with their status as relatively cheap and plentiful labor in the provision of undergraduate education, a factor that creates growing affinities with those whose service work keeps the lecture halls clean, the courses running on time, and the cafeterias pumping out food

and notes that in recent years there has been an increase in struggles in the post-secondary sector around the world.

The second consequence is the crisis of the classical humanistic university, above all for directly economic reasons, resulting from a shift in the main task of the university from developing men of judgment and property to developing intellectually skilled wage-earners (Mandel 1980, p. 261). Basken (2008) quotes Diane Auer Jones, who resigned as assistant secretary for post-secondary education in the U.S., as saying "the Education Department is controlled by advisers who have insufficient regard for the liberal arts and instead are intent on judging colleges largely by their ability to provide economically measurable talent for industry". As discussed above, Prosser (2011) points out that part of the current situation in 2010 was plans to eliminate funding for humanities and social sciences in the U.K. university system altogether.

Irrational Rationalization

In addition to commodification, publishing is also subject to an accompanying process of rationalization. Developing intellectually skilled wage-earners is an excellent example of behaviour carefully planned to achieve rationally calculated goals. Aspects of the system of scholarly communication described in this chapter exemplify modern times combining formal (calculating) rationality with substantive (goal-oriented) irrationality, a concept articulated by Weber (1968, p. 24-5, 85), or the cunning of unreason described by Leiss (1994, chapter 1) as the essential problem of rationality: human beings are not rational.

A participant with a long history working in senior positions for university presses provided the following example in a recent interview (Anonymous, 2011): many university departments expect scholars to publish books in order to achieve tenure. It is common for scholars to seek to turn their theses into a published book as a means of achieving the goal of tenure. In recent decades, academic library budgets have been diverted from purchase of monographs to purchase of journal packages in STM, as described above. In roughly the same time period, academic theses have become more readily available in universities, at first through electronic packages of theses such as the Proquest Dissertations and Theses database, and more recently through provision of open access theses through institutional repositories. Lacking funds to purchase every scholarly monograph of interest, university libraries instruct vendors to eliminate books developed from theses from approval plans, on the grounds that these are duplications. This erodes necessary financial support for a system that universities are relying on as part of the tenure process. Another result is gaming of the system, with publishers

deliberately obscuring the connection between the thesis and book, through such means as eliminating acknowledgements of participants in the thesis process, such as supervisors and committee members. This practice diminishes the value of the work, and is contrary to the academic ethos calling for citation of sources. Each element of this process is rational in and of itself. However, these rational processes work towards incompatible goals. This is what Weber calls substantive irrationality. Colloquially, another way of expressing this is to say that the process as a whole simply does not make sense. That is, universities are relying on this system for tenure decisions, and, at the same time, defunding the system. Thompson (2005, p. 175-6) describes the paradoxical situation that universities are basically outsourcing tenure decisions in disciplines focused on monographs to academic presses, and especially to university presses, during the very same period of time when university economic support for scholarly monographs and university presses was diminishing.

Universities, as a whole, are the source for the above average profits of a small group of commercial STM journal publishers, even when universities themselves are facing brutal cuts. The means to this dysfunctionality for universities exemplify instrumental rationality, defined by Weber (1968, p. 24-5) as behaviour that is "determined by expectations as to the behavior of objects in the environment and of other human beings" which are "used as "conditions" or "means" for the attainment of the actor's own rationally pursued and calculated ends".

To return to the McHugh and Kowalski article at the beginning of this chapter, it is perfectly rational for the authors to seek to publish in a journal that will be highly regarded by tenure and promotion committees, serving the instrumental value of career

advancement. However, publishing in a journal that is not accessible to people who could use the Information discovered through this research, is contrary to the value of helping people implicit in this kind of research – substantive irrationality, where behavior that is formally / instrumentally rational is not compatible with our basic values.

Sage, Elsevier, Wiley, and other commercial publishers are behaving rationally in pursuing actions to maximize profit, the purpose of existence of their organizations. Universities in times of decreasing revenues quite rationally seek to contain costs through such means as cutting subsidies to university presses. To see how individually rational approaches add up to a system that is arguably dysfunctional for the universities it is meant to serve, it is necessary to consider the whole picture rather than individual elements.

Another aspect to the increasing tendency to formal rationality of assessing scholarly work involves a focus on quantity. For example, more competition for academic jobs means that scholars are expected to publish two books instead of one to obtain tenure; this rush to publish is in contrast with the time it takes to write scholarly books (Thompson 2005, p. 176-7). Harley and Acord (2011) note that one of the results is a growing glut of low-quality publications, and recommend that we "encourage scholars to publish peer-reviewed work less frequently and more meaningfully. Limit the quantity of work that can be reviewed to remove the incentive for over-publication" (p. 7), including eliminating the requirement of two published books to achieve tenure.

The Georgia State copyright case is one illustration of the irrationality of the system. The case involves publishers seeking higher rents from use of their works by universities; it is ironic that two of the publishers prominently involved are university

presses, Cambridge and Oxford. As Kevin Smith, one of the interviewees in an article in *The Chronicle of Higher Education* (2011, May 30) puts it:

> As it becomes clear that the three publishers who have initiated the lawsuit in search of higher profits are willing to attack the very heart of the system by which scholars live, academic authors will rightly feel betrayed. The plaintiffs are, after all, asking the judge to fundamentally change the copyright rules for higher education. If the rules in the proposed injunction were widely accepted, fair use in this field of endeavor, supposedly favored, would actually be more restricted than in any other activity. Yet the works at issue in the lawsuit are mostly written by scholars for the use of other scholars and students. If those uses become impossible or exponentially more expensive, which today is the same thing, academic authors will need to reconsider whether they are receiving sufficient benefits for the free labor they contribute to scholarly publishing.

Cambridge and Oxford, unlike U.S. university presses, return a profit to their universities (Thompson 2005, p. 87). This is an example of a system developed through rationality that becomes irrational – a system meant to help universities harms them instead. This illustrates what Marcuse (1964) and Leiss (1994) discuss as the tendency of instrumental rationality, designed to dominate nature, in the end, dominating man. In scholarly communication, the quest for simple metrics to assess quality in academia (the impact factor, # of books published, by which presses), initially meant to help achieve the goals of the academy, instead become the goals themselves.

It is important to consider the tendency toward rationalization in our society along with commodification. There is some overlap in the two tendencies, and it can be difficult

to distinguish between the two, but the roots are different and the remedies may well be different, too. Both are often present in the same situation. The nonprofit university press is a good example, subject to expectations of cost-recovery (rationalization), which in turns leads to pressure to focus on the market value of scholarly materials (commodification). The overall remedy to the substantive irrationality of this system, I would argue, is the kind of systemic analysis presented in this chapter and several of the works cited in this chapter. A university press may find a variety of ways to combat commodification, for example advocating for subsidies, or developing commodified product lines designed to provide income to subsidize the publication of scholarly monographs.

Alternatives

The commons

The concept of the commons, once in general use to refer to land shared in common, has re-emerged and expanded in recent decades to include immaterial commons such as the Information commons or knowledge commons (Lessig (1999), Hess and Ostrom (2007), Boyle (2003) and Bollier (2007)). Boyle (2003) and Bollier (2007) point out that there is a need to articulate the concept, similar to the need for articulation of the concept of the environment. Boyle argues for the proactive creation of a concept of commons as public domain, a reification of the negative to protect this space. Bollier (2007) sees the rise of the commons paradigm in scholarship as a needed alternative to the market and the state. Bollier also discusses the idea of inalienability (some things belong to all), and also public trust doctrine, from Roman law; the idea is that some things belong to the public, and are administered by the state as a trust. Bollier points out

that commons and market are not incompatible; in fact business needs a commons (e.g. roads, telecommunications).

Whenever the commons is discussed, it is important to be aware of a group of arguments against the possibility of a commons collectively known as the *free-rider problem*. Ostrom's book (2007) *Governing the Commons* explores in depth relevant theories and presents case studies of physical commons or collectively shared resources such as fish or water. Acknowledging that commons are not always successful, Ostrom provides important arguments that explain why the free-rider problem is by no means inevitable, even with physically limited resources (Ostrom 2007, p. 6-7). The free-rider argument per se, based on an article by Hardin, is often cited but has never been examined empirically, and Ostrom presents many counter examples of successful sharing of resources in common. One example is the Huerta irrigation institutions in Spain; formal rules were written up for these institutions in 1435, however they were not new at this time. Through significant monitoring and enforcement, cheating rates in these institutions have been remarkably low in spite of significant temptation; in medieval Castellon, the cheating rate was below 1%. A related argument, the prisoner's dilemma, a game which appears to show that people do not cooperate, is based on the assumption that people do not communicate, an unrealistic assumption outside of actual prisons.

Immaterial commons such as knowledge or Information commons are nonrivalrous in nature, and many exemplify "the cornucopia of the commons" in which more value is created as more people use the resource and join the social community (Bollier 2007, p. 34). The article by McHugh and Kowalski cited at the outset of this

chapter is a great deal more valuable if it is read by other researchers, young aboriginal women, social workers, teachers, and government officials.

Knowledge commons

My vision of the knowledge commons is one where humankind's collective knowledge is readily available to anyone, anywhere. A similar vision focusing on the area of medicine and the life sciences was articulated by the Public Library of Science (2001) in their *Open Letter to Scientific Publishers*, signed by thousands of researchers around the world. From my perspective, key to development of a knowledge commons is open access to scholarly literature, a concept that will be discussed in depth in the next chapter.

Cooperative solutions

Many of the suggested alternatives focus on cooperative solutions, similar to the concept of the commons, to make it possible for smaller and/or not-for-profit publishers to benefit from the advantages of scale available to the large commercial publishers, so that they can compete. Brown (2010) recommends a cooperative solution across universities for university presses. Crow's (2006) discussion paper for the Scholarly Publishing and Academic Resources Coalition (SPARC) on publishing cooperatives provides in-depth analysis of the potential for, benefits of, and logistics for starting publishing cooperatives.

Emerging new publishers: libraries and independent scholar-publishers

While university presses are in dire straights, university libraries are increasingly becoming involved in publishing. Hahn (2008) reports on a survey of Association of Research Library members which found that the majority of respondents either were

involved in publishing activities, or had plans to get involved in publishing, within the next few years. Library publishing services described are different from traditional university press publishing services in that libraries tend to focus on electronic-only publishing, to focus on technical support and hosting rather than editing, and to favor open access business models. Library publishing services are more likely to focus on journals, although some also publish monographs and conference proceedings. Unlike university presses, library publishing services are not isolated in their institutions, but rather tend to be part of larger initiatives that include similar activities such as digital repository services. Similarly, Taylor, Morrison, Owen, Vézina, and Waller (2011) found that most university libraries in Canada were hosting open access journals as of spring 2010, with more planning to offer such services in the near future.

Willinsky (2006) and colleagues in the Public Knowledge Project have been instrumental in making library and scholar journal publishing a possibility through development of the free, open source journal publishing platform Open Journal Systems (OJS). Edgar and Willinsky (2010, in press) conducted a survey of over 900 journals using OJS and found that many were led by independent scholars; they conclude that OJS may be facilitating a renaissance of scholar-led publishing.

Research questions

Need for theory and analysis

Development of new approaches such as the commons requires careful exploration of theoretical perspectives, often definitions and analysis of real-world implications. In particular, macro level and critical approaches are necessary to sidestep the problems associated with formal instrumental rational approaches that can easily lead to substantive irrationality.

One example is my work on the implications of basing decisions about library collections on usage statistics. It is tempting to use such easily gathered quantitative Information to aid in making difficult decisions, however if this will lead to such unintended consequences as discouraging reading and important areas of scholarship, the sooner we understand this, the better.

Open access and its intersections with scholarly communication is another area in need of thoughtful theory and analysis. As we shall soon see, this exciting remedy to the problem of commodified scholarly communication is now being avidly pursued by commercial interests – in some cases the very same commercial interests responsible for the present crisis. The implications of this need careful examination.

Dramatic growth of open access

To appropriately assess progress towards a knowledge commons through open access, it is necessary to grasp how much scholarly literature is produced, and how much is open access. A recent repeated citation of an error illustrates the ongoing need for this research. Walters and Linville (2011) repeat an error based on a publication by Morris (2006). Morris, then Chief Executive Office of the Association for Learned and Professional Society Publishers (ALPSP), did an analysis of start years in the Directory of Open Access Journals (DOAJ) and concluded that open access publishing had peaked in 2001, with new journal start-ups decreasing after that time. One major problem with this approach is failure to account for delay in including new titles in DOAJ; because of the DOAJ vetting process, new titles are not included on first publication, but rather after they have established at least some track record for publishing. Then, too, DOAJ has limited staff, so there can be a backlog in including new titles. Recent research (see the chapter on The Dramatic Growth of Open Access) illustrates that open access publishing

is growing. It is important to be aware of this trend. Libraries and scholars need to be aware of the growing OA resources in order to know to point to these. Publishers need to be aware of the trends to make informed decisions about business models for the future.

Economics of transition

Shifting from a system increasingly devoted to profits to one that can prioritize knowledge will require an economic transition. This chapter will examine the economics of scholarly publishing at a macro level as well as current and potential new approaches to scholarly communication economics.

Disciplinary specifics

The patterns of scholarly communication can vary widely from one discipline (or sub-discipline) to another. Some disciplines rely more on monographs, others on journal articles. Some disciplines are more dominated by commercial interests than others. This thesis will report on a preliminary investigation of the state of scholarly publishing in the discipline of communication.

Summary

Scholarly communication at present is a complex system characterized by expansion of capitalism into scholarly publishing and a process of rationalization that at times leads to irrational results in conflict with the basic goals or values of scholars. The increasing enclosure of knowledge and Information through the concept of intellectual property is key in the process of commodification of resources once considered a classical public good as nonrivalrous and nonexcludable. Alternatives identified to date include the commons, cooperative approaches, open access and emerging new publishers such as libraries.

Chapter 3: Open access as solution to the enclosure of knowledge

What is open access?

Open access is an elegantly simple concept. As expressed by Suber (2010, n.p.), in his *Open Access Overview*: "Open access literature is digital, online, free of charge, and free of most copyright and licensing restrictions".

Like many an elegantly simple concept, there is much more to open access than this. There are sub-concepts within the overall concept. It can be difficult to separate open access from related and often overlapping movements and trends. Examples of such overlapping trends are open source, free software, open data, open education, open research, creative commons, and open government. Then there is the influence of a powerful and wealthy anti-open access publishers' lobby. To fully understand open access discussions it is essential to know something about this group and their tactics, which sometimes includes deliberate deception. One example as reported by Giles (2007) in *Nature*, is the Association of American Publishers' hiring of Eric Dezenhall, known as the 'Pit Bull of Public Relations'. Giles reported that, according to e-mails leaked to him, several executives from Elsevier, Wiley, and the American Chemical Society, met with Dezenhall, who subsequently sent some strategy suggestions, to focus on simple messages such as "public access equals censorship", and "attempt to equate traditional publishing models with peer review". Late in 2011, Bill HR 3699, the *Research Works Act*, was introduced in the United States by Representatives Issa and Maloney (2011). This bill would roll back many of the important gains made by the open access movement, and prohibit the U.S. government from requiring open or public access to the

published results of research that it funds. Links to extensive commentary and counter-advocacy can be found through the Open Access Tracking Project (2012). Bias can and does occur in *any* area of scholarly inquiry. When assessing open access arguments, it is useful to keep in mind the above average profits that some arguments are designed to protect.

The initial focus of the open access movement, and its associated definitions, was the scholarly, peer-reviewed journal article. The reason for this focus is that the peer reviewed journal article has traditionally been given away by scholars, avoiding the complexities of royalties associated with scholarly monographs. A movement for open access to scholarly monographs has more recently emerged.

Budapest, Berlin & Bethesda: the BBB definition of open access

From 2002-2003, a series of international meetings were held in three cities with names that happened to begin with "B". The purpose of these meetings was to bring together like-minded individuals and organizations with a common desire to make scholarship freely available online, and hammer out a common term and definitions. The Budapest Open Access Initiative (2002), the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (2003), and the Bethesda Statement on Open Access Publishing (2003), all include very similar definitions of open access, so that collectively this is referred to as the BBB definition of open access. There is more to the Budapest, Berlin, and Bethesda (BBB) statements than defining open access; each statement includes strategies for, and commitment to, implementing open access. Following is the first and most succinct of the definitions of open access, from the Budapest Open Access Initiative (2002):

> By "open access" to this literature, we mean its free availability on the public Internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the Internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited.

The only element considered missing from Budapest is immediate open access, addressed in the subsequent Bethesda statement. When publishers make back issues freely available, they are expanding access, but this is not full open access. To avoid confusion, it is best to refer to this approach as free access to back issues.

There are two basic ways of providing open access. Publishers can make a work open access as part of the process of publishing. This is sometimes called open access journals, open access monographs, or gold open access. Or, a work can be placed in an archive or repository in order to provide open access; this is sometimes called self-archiving or green open access. These two approaches are compatible. An article can be published in an open access journal, and also deposited in an open access archive.

Two kinds of open access: gratis (free to read) and libre (free to re-use)

There are two key aspects of free in the major definitions of open access, and there are two corresponding sub-definitions of open access, reflecting this distinction. Suber (2008b) coordinated the discussion that led to the distinction between gratis and libre open access.

- gratis open access: free to read / free of charge
- libre open access: free to read / free of charge, and free of at least some copyright and licensing restrictions / free for re-use

In practice, there are many variations on these themes. There are items that are free to read online, but not to download or print. There are documents that are free to read, print, or distribute, as long as the usage is not commercial in nature. Derivatives are allowed with some open access works, but not others. This distinction is important. Scholarly communication is in transition. The majority of scholarly journals, whether subscriptions-based or open access, are neither fully closed nor fully open. Most subscription-based journals allow authors to self-archive, and many provide free access to back issues. Open access journals range from just gratis, to fully libre, with many shades in between. Open access can be seen as a continuum. Willinsky (2006) covers the many flavors of open access in *The Access Principle*. Libre open access may be optimal, but it is much better to have a work that is free to read than one with a toll to access that you cannot afford to pay.

The global reach and benefits of open access

Figure 1: number of journals in DOAJ by region 2012

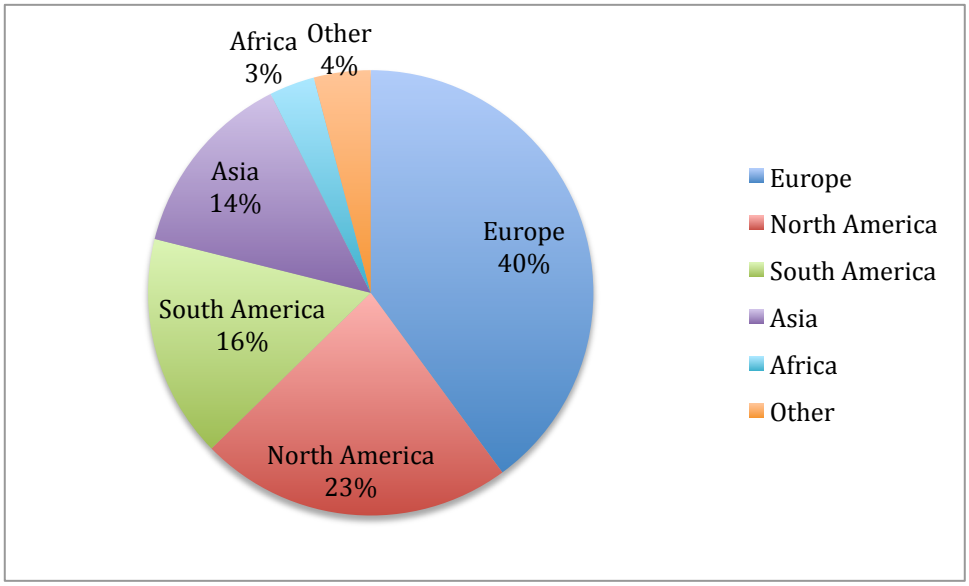
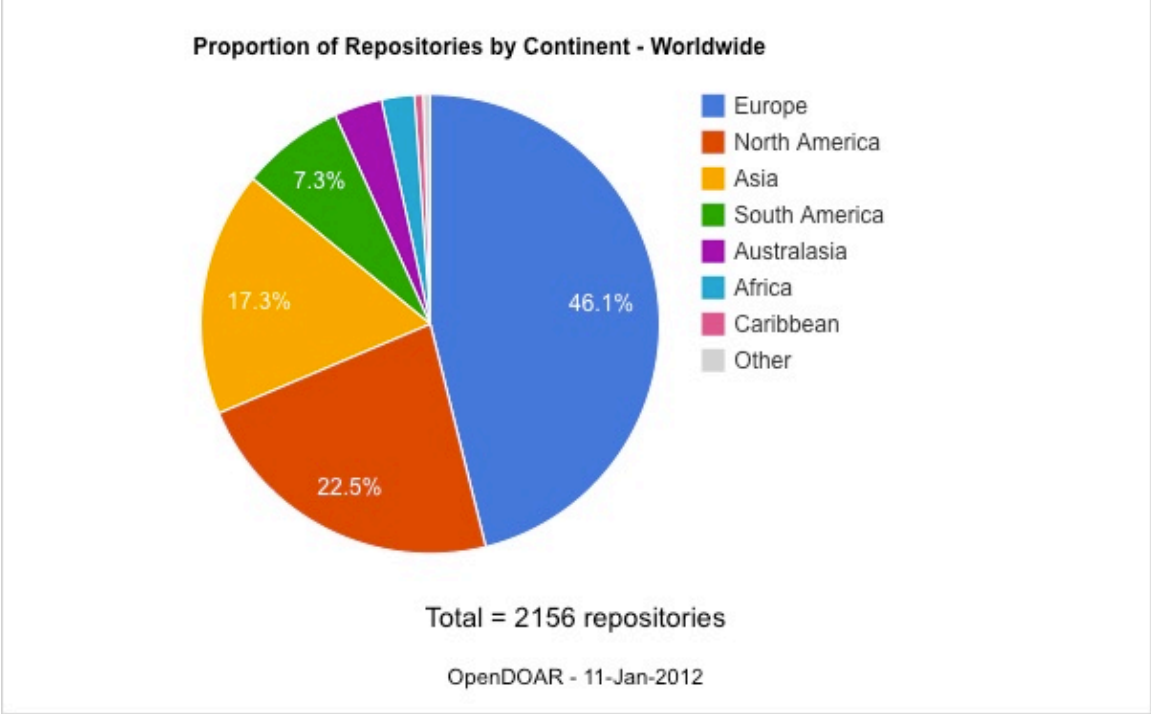


Figure 1 illustrates the global reach of open access journal publishing. Of the 117 journals listed in the Directory of Open Access Journals as of January 2012, 40% are from Europe, 23% from North America, 16% from South America, 14% from Asia, 3% from Africa, and 4% from other areas such as the Caribbean and Central America. A detailed breakdown of DOAJ journals by region and country can be found in the Appendix A, *Open access journals by country and region*.

Figure 2. Open access repositories by continent (OpenDOAR)



Source: OpenDOAR (2012). Repositories by continent.

Figure 2 illustrates that the global division of open access repositories by continent is very similar to that of open access journals. The largest portion of repositories are found in Europe, followed by North America. Asia is the third largest source of repositories, followed by South America, reversing the third and fourth positions for journals.

Some of the global benefits of open access are covered by the section of the Budapest Open Access Initiative (2002) quoted at the very beginning of this thesis, repeated here with emphasis added:

> An old tradition and a new technology have converged to make possible an unprecedented public good. The old tradition is the willingness of scientists and scholars to publish the fruits of their research in scholarly journals without

> payment, for the sake of inquiry and knowledge. The new technology is the Internet. **The public good they make possible is the world-wide electronic distribution of the peer-reviewed journal literature and completely free and unrestricted access to it by all scientists, scholars, teachers, students, and other curious minds. Removing access barriers to this literature will accelerate research, enrich education, share the learning of the rich with the poor and the poor with the rich, make this literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge.**

A study by Kirsop et al. (2007) illustrates the difference open access makes for the developing world. Bioline International is an organization dedicated to helping scholarly publishers in the developing world publish high-quality journals in the electronic environment. Downloads from about 60 Bioline International open access journals reached 2.5 million in 2006. On a per-usage basis, this is much greater usage than that reported for the publisher-mediated program HINARI, which provides limited access to developing countries for the subscription journals of the developed world on a charitable basis. The 2006 article downloads for HINARI was about 3 million for about 3,000 journals. Without open access or charitable programs, both of which aim to increase access without the exchange of fees, access to the scholarly literature in most developing countries would be virtually nil. Charity programs like HINARI are a significant improvement over no access to the scholarly literature. However, open access facilitates a model of equity in which everyone has access to all of the scholarly literature, and the ability to contribute.

Open access and Creative Commons

The vision of Creative Commons (CC) is "nothing less than realizing the full potential of the Internet — universal access to research and education, full participation in culture — to drive a new era of development, growth, and productivity". (Creative Commons, 2011). It is somewhat ironic that the vision of an organization generally assumed to advance free culture as defined by Lessig (2004) reads rather like a capitalist's dream. Why not drive a new era of sharing and collaboration, arguably a primary function of CC licensing, rather than development, growth, and productivity?

Founded in 2001, the goal of Creative Commons is to overcome the barriers created by traditional copyright to the kinds of sharing of Information made possible by the Internet. CC provides an easy means for authors and other creators to license works for sharing in a way that is easy to read and comes in forms designed for human reading (both text and icons), machine reading (e.g. one can do a flickr search and limit results to CC licensed materials), and legal code.

Figure 3. Creative Commons licenses

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We also provide tools that work in the "all rights granted" space of the public domain. Our CC0 tool allows licensors to waive all rights and place a work in the public domain, and our Public Domain Mark allows any web user to "mark" a work as being in the public domain.

From: Creative Commons (2011) http://creativecommons.org/licenses/ CC-BY

There is much overlap between Creative Commons and open access. Some open access advocates consider the CC attribution only or CC-BY license to be equal to the Budapest definition of open access. That is, the work must be appropriately cited attributed, but otherwise all other uses, including commercial uses, are allowed. For example, the Scholarly Publishing and Academic Research Coalition (SPARC) Europe and the Directory of Open Access Journals (2011) require the CC-BY license for a journal to be given the SPARC Europe Seal for Open Access Journals.

My perspective is that while on the surface the CC-BY license reflects the Budapest open access definition, there are substantial weaknesses of the license that make it less than optimal for sustaining the vision of what open access is meant to achieve, such as the "sharing of the rich with the poor and the poor with the rich". I argue that the strongest open access license is CC attribution-noncommercial-sharealike (CC-BY-NC-SA). The noncommercial element, while problematic within the context of the present version of CC licenses, can protect works from commercial exploitation, and the sharealike provision introduces an element of copyright, ensuring more open access downstream.

Here are two hypothetical examples of why I consider a CC license including the sharealike element to be a stronger open access license than one lacking this element. The CC-BY license would permit the development of new tools using data mining built on top of the original open access works. These tools could be developed on a commercial

basis, and locked behind a paywall. An author who gave away their work as CC-BY might not be able to afford the commercial tool developed from this giveaway. If journals and/or scholars in the developing world were to adopt this license en masse, it is quite possible that scholars in the developing world would trade off one small advance by making their work more openly accessible, but very quickly find that, relatively speaking, they are even further behind as scholars in the developed world have access to tools built on their work not available to them. Similarly, scholars in the developing world giving away medical images could find that these images become part of a for-pay commercial point-of-care tool which is not affordable in their home country. Sharealike would address the problem identified in both these situations, as the tools created from the authors' works would have to be made freely available.

One critique of the hypothetical approach that I am using with these two examples is its hypothetical nature, and lack of real world evidence. One of my key points is that there are potential dangers with adoption of CC-BY *en masse*. This is largely a future rather than a present vulnerability of open access with mass adoption of CC-BY. If all of the journals listed in DOAJ used CC-BY licenses, this would increase the feasibility of using these journals as tools to create commercial options. However, most journals in DOAJ currently do not use CC licenses at all. Suber and Sutton (2011) found that only 15% of the scholarly society journals listed in DOAJ used CC licenses, compared with 24% of DOAJ overall in an earlier study by Shieber that they cite; of these, many use licenses other than CC-BY. It is a much more difficult task to determine rights in this situation than would be the case if all the journals used CC-BY licenses.

The sharealike provision would tend to prevent this situation from occurring, by clearly stating to potential users that enclosure of downstream copies is not acceptable, and by providing a legal remedy should this situation occur. Tools built on open access CC-BY-SA would also have to be freely shared.

There are also reasons for supporting the CC noncommercial element. CC-BY allows a commercial company to copy works and sell them. They cannot legally remove the open access originals, but they have no obligation to ensure that they remain available. Journals start and stop all the time, as the need for a particular journal changes, the editor moves on to other interests. If the open access copy of a journal disappears, and there is a commercial version, it is possible that the only way to access some open access journals in future will be by purchasing commercial versions. With widespread adoption of CC-BY, commercial capture for resale purposes would be much more tempting, and it is possible that the commercial interests would take steps to eliminate the free competition.

One conundrum with any CC license that involves restrictions is determining who is retaining rights: in the case of a scholarly journal article, is it the author or the journal that is retaining rights? The copyright notice of the Co-Action Publishing's open access *Journal of Aesthetics & Culture* (2011) provides one of the clearer examples, saying:

> Authors contributing to *Journal of Aesthetics & Culture* agree to publish their articles under the Creative Commons Attribution-NonCommercial 3.0 Unported license, allowing third parties to share their work (copy, distribute, transmit) and to adapt it, under the condition that the authors are given credit, that the work is not used for commercial purposes, and that in the event of reuse or distribution, the terms of this license are made clear.

> Authors retain copyright of their work, with first publication rights granted to Co-Action Publishing. However, authors are required to transfer copyrights associated with commercial use to the Publisher. Revenues from commercial sales are used to keep down the publication fees. Moreover, a major portion of the profits generated from commercial sales is placed in a fund to cover publication fees for researchers from developing nations and, in some cases, for young researchers.

In the case of the *Journal of Aesthetics and Culture*, while CC licensing is used, it is clear that both author and journal retain certain rights. In the journal's Editorial Policies there is mention of commercial reprints and advertising. This indicates what the journal is retaining commercial rights. However, this must be inferred, and is not part of the license. A future editor (or journal owner) could change practices with respect to commercial rights.

Cellular Therapy and Transplantation (CTT) practices what I consider to be the optimal policy for an open access journal for CC licensing, requiring authors to use a CC license, but leaving copyright with the authors and allowing the author to select the CC license of their choice from among the full set of CC license options. (Thanks to CTT's Claudia Klotenzberg for pointing to this example)[7].

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[7] The CTT Copyright Notice says:
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The policy of encouraging authors to choose their own CC license is one that fits best with a vision that I have of a project of involving as many of us around the planet, for years to come, in a conversation on articulating the commons (Morrison, 2011a). The reason that I believe that this project is necessary and desirable is because the western / developed world approach to intellectual property is part of a very limited world-view. We would all be better off broadening the conversation to include non-western perspectives, such as the world views of indigeneous peoples whose wisdom included the knowledge of how to live harmoniously with the ecosystem, rather than destroying it as western society tends to do. One example of a traditional world-view, from Charles Royal on Maori creation myth, as quoted in Greg Young-Ing [2006]:

> "*The natural world is not so much the repository of wisdom but rather is wisdom itself, flowing with purpose and design. We can say that the natural world is a mind to which all minds find their origin, their teacher and proper model. Indigenous knowledge is the fruit of this cosmic stream, arising organically when the world itself breathes through and inspires human cultural manifestation... Leading from this view of the world being alive, conscious and wisdom filled is the obvious conclusion that all that we need to know, all that there is to know and all that we should know already exists in the world, daily birthed in the great cycle of life. That is, human cultural production is a natural organic expression arising from the contours, shapes and colours of the*

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environments in which we dwell".

A global broadening of the conversation around the commons and "intellectual property" is a major undertaking which is likely to take decades; inviting authors to think about their rights, even through such simple matters as making a decision about a Creative Commons license, is a small step towards encouraging this broader conversation.

One reason for journals to consider the noncommercial CC license element is that all journals need resources to survive. Reserving commercial rights gives open access journals an opportunity to negotiate for revenue. For example, a commercial company might wish to include an open access journal in an aggregated package of journals. It is customary for such companies to pay subscription based journals to include their content in the package, and this could be a needed source of revenue for open access journals as well. An open access journals ecosystem that includes opportunities to financially sustain journals is, in my opinion, a stronger ecosystem that one that gives up all such rights through CC-BY licensing.

One negative to the CC noncommercial element is that there is a wide variety of possible interpretations of what constitutes commercial use. For example, if someone finds an open access article through a commercial search engine like google, does this constitute commercial use? One important instance is educational use. Whether educational use is commercial or not is debatable, and contested. Creative Commons (2009) published a study toward clarification of what creators and users consider noncommercial use. As of early 2012, Creative Commons is holding discussions to develop Version 4.0 of the licenses. Hopefully, this next version will result in a more workable definition of the noncommercial element.

Some open access journals use the CC noderivatives element. This is consistent with gratis but not libre open access.

Open access and Creative Commons have much in common, but open access does not map precisely to any one Creative Commons definition. Nevertheless, while CC is an imperfect tool, it is the best one available or likely to be available in the near future to facilitate communication between creators and end-users about what permissions are available with an open access work.

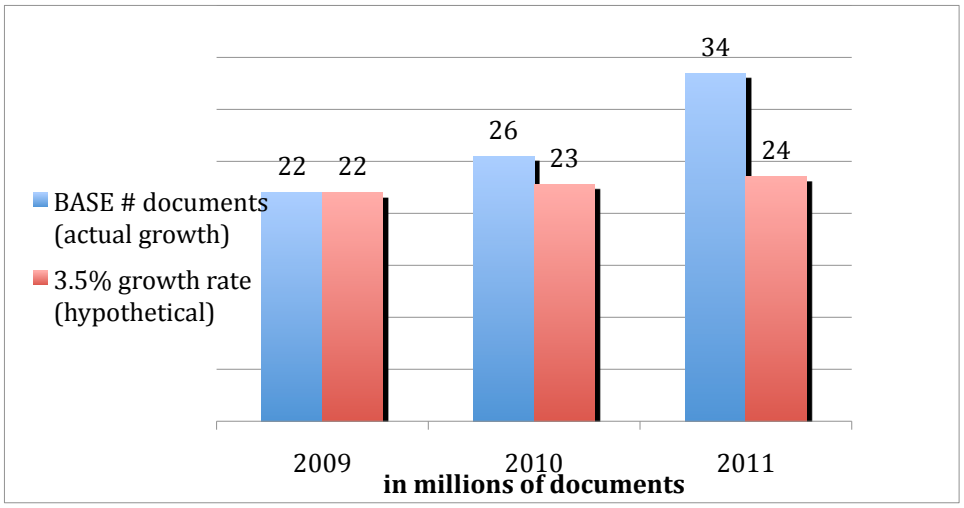
Open access archives (green OA)

There are more than two thousands open access archives listed in the Directory of Open Access Repositories (OpenDOAR), a service which "provides a quality-assured listing of open access repositories around the world" (OpenDOAR, 2011). OpenDOAR is adding repositories at a rate of about one per day. This figure comes from my *Dramatic Growth of Open Access* series (Morrison, 2004 -), as do other figures in this chapter unless otherwise specified. The methodology for this series, links to ongoing data series and commentary, can be found in Appendix B.

The Bielefeld Academic Search Engine (BASE) is a search engine designed to cross-search open access repositories using the Open Access Initiative-Protocol for Metadata Harvesting. A BASE search currently encompasses over 30 million items, a number that is growing by about 2 million per quarter. It would be very difficult to determine exactly how many open access journal articles are covered in a BASE search, and as in some instances it is only metadata, not the actual object, that is freely available. There are many types of objects in repositories, including data and historical records as well as scholarly articles, and there is some duplication. However, it would be safe to say

that there is a lot of material available through open access archives, and the amount is growing at a substantial pace.

Figure 4. BASE growth rate compared with average for scholarly publishing



This figure contrasts the actual BASE growth rate from 2009 to 2011 with what BASE growth would have looked like at the 3.5% average growth rate reported by Ware and Mabe discussed in chapter two. The 2010 growth rate for BASE was 15%, while in 2011 the growth rate was 30%. In other words, the BASE growth rate for 2011 was an order of magnitude greater than the average growth rate for scholarly publishing.

Repositories can be based at an institution, or organized by discipline. Following are a few examples which illustrate a diversity of approaches which may be conceived to reflect several different models for building a knowledge commons.

PubMedCentral (PMC), hosted by the U.S. National Library of Medicine, is the world's largest open access repository. A search of PMC from Entrez PubMed, NLM's free version of Medline, for free fulltext yields over 3 million items.

PMC expands access by including works that are publicly or openly accessible, but PMC does more. One of the purposes of PMC is archiving of the medical literature in

electronic form. Preservation of the medical literature has long been a mandate of the U.S. National Library of Medicine. PMC carries this function into the online environment. PMC archives materials in XML format, for preservation purposes.

Another advantage of XML is that it allows PMC to facilitate linking, from Entrez PubMed to PMC and back, from one article within PMC to another, and to other U.S. National Library of Medicine resources such as the Genome database.

PMC is designed to become an international collaboration of digital archives specializing in medicine and allied health sciences. The vision is one of every country contributing the results of their own research, and hosting a local archive of the whole of PMC. So far, international PMC's are operational in the U.K. (UKPMC) and Canada (PMC-Canada). Discussions and/or testing are in progress on the creation of more PMC archives in other countries, including China, Japan, South Africa, and Italy (PubMedCentral, 2007).

arXiv.org is an e-prints server for physics, mathematics, computer science, quantitative biology and statistics. Launched in 1991 by Paul Ginsparg, arXiv is the world's oldest and second-largest open access archive. The main arXiv server is hosted by Cornell University Library, with 18 mirror sites in 15 countries. Self-archiving in some areas of physics, such as high energy physics, is nearly 100%. arXiv is heavily used; connections statistics of over a million per day on the main server alone are not unusual. arXiv builds on a preprints culture in physics. arXiv e-prints are what physicists tend to *read*, while relying on the final published version for certification purposes.

RePEc, Research Papers in Economics, is a large collection of papers in economics, distributed in many institutional repositories. Economics is a field which

shares with physics a long history of sharing of working papers prior to publication. RePEc relies on a model of international volunteer collaborators. E-LIS, the open archive for library and Information studies, follows a similar model.

There are hundreds of institutional repositories around the world, mostly in universities. The Association of Research Libraries (2006) conducted a survey which found that more than 30% of ARL libraries had an institutional repository in 2006, and it was anticipated that more than 55% would have an operational IR by the end of 2007.

Searching for the largest repositories through OpenDOAR reveals the global reach and wide variety of the institutional repository movement. The numbers can be misleading, as some archives are fully open access, while others feature a mix of freely available metadata and open access items. Dspace@Cambridge contains a variety of materials, including a substantial dataset of small molecules. The Aristotle University of Thessaloniki Repository includes tens of thousands of theses, articles, papers and photos from students and faculty at the university. DSpace at Vidyanidhi, an institutional repository for the university at Mysore, contains more than 50,000 doctoral theses. The National Taiwan University Repository provides access to the research output of the university, more than 45,000 items.

SHERPA RoMEO Publisher copyright policies & self-archiving provides a summary of permissions normally provided for self-archiving in publishers' copyright agreements. This is a useful tool for authors looking for suitable venues to publish in when they would like to make their work open access, and for authors and archives staff alike to look up publishers' policies. A list of publishers offering paid open access as an option is available as well.

As institutional repositories are relatively new, key issues are education, promotion, content recruitment, copyright / author's rights, and open access policy (see policy section below). There are also emerging issues with development of the technology so that it will be easy to use and attractive for users.

Occasionally, deposit of one item in multiple repositories is seen as an issue. For example, an author may wish to deposit in both an institutional and subject repository; in some cases, authors may have more than one institutional repository with which they are affiliated. Also, a document with multiple authors may be placed in many repositories. While multiple deposits are not necessary due to the availability of searching across repositories using the OAI-PMH protocol, multiple deposits are desirable from the point of view of preservation, following the principle that multiple copies decreases the likelihood that documents will become inaccessible in the future. There are workload issues with multiple deposits, but these may be mitigated with the full deployment of tools such as SWORD and support.

Open access journal publishing (gold OA)

As of 2011, there are over 7,000 fully open access peer-reviewed scholarly journals listed in the Directory of Open Access Journals (DOAJ), and the number of titles is growing by about 4 per day. DOAJ is a vetted list managed by librarians at Lund University in Sweden. Potential titles are vetted for open access status. To be included, a journal must be fully open access; no embargo period is accepted. The journal must also practice peer review or an equivalent form of quality control, such as control by an academic editor. Journals must be active to be included, publishing at least 5 peer-

reviewed articles per year, and generally journals must publish at least an issue or two before they are included. DOAJ weeds titles that no longer meet the criteria.

Figure 5: DOAJ titles growth 2004 – 2011 contrasted with average 3.5% growth rate

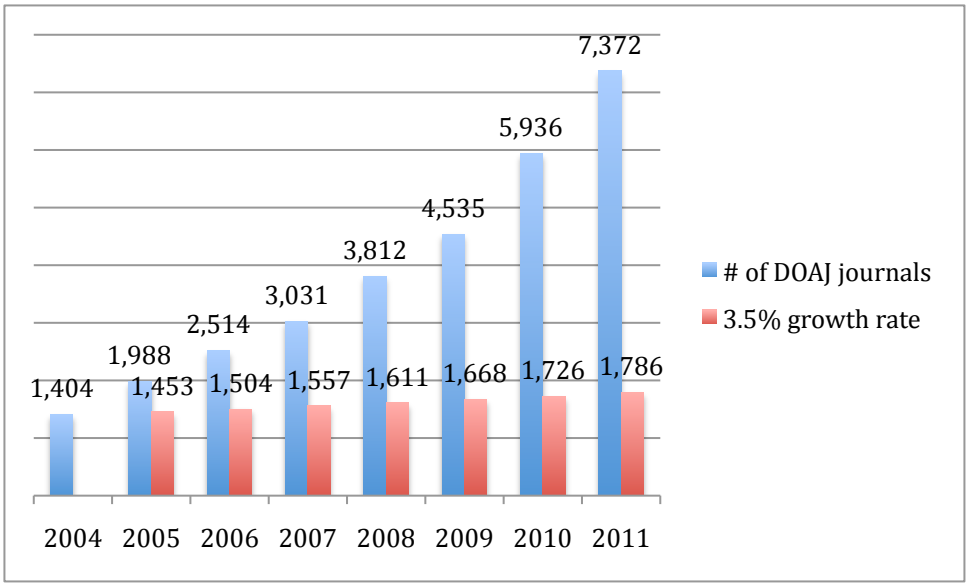


Figure 5 contrasts the actual growth of DOAJ from 2004 to 2011 with what DOAJ growth would have been at the average scholarly publishing rate of 3.5% annually. Cumulatively, DOAJ increased more than fivefold over this period, while at the average growth rate for scholarly publishing of 3.5%, the cumulative growth would have been only 22%.

Frantsvåg (2010) reports that most open access publishers are very small, with 90% producing only one journal. More than 9,000 journals around the world use the free, open source software Open Journal Systems, developed by the Public Knowledge Project, for journal publishing. About half of these journals are fully open access, and almost all are at least partially open access (for example, by making back issues available for free). Edgar and Willinsky (2010), as noted in the previous chapter, describe this situation as a renaissance of scholar-led publishing.

The Public Library of Science (PLoS) is a small but well-known open access publishing outfit, developed initially for the purposes of open access advocacy and well as publishing. PLoS aims to compete at the top end of prestigious academic publishing, and has been very successful. Four of the PLoS journals are already at the top in their fields by impact factor, a very impressive accomplishment for such new journals.

The commercial sector has played a major role in open access publishing since its inception. The world's largest open access publisher is BioMedCentral (BMC), a commercial company, with about 200 titles. In 2008, BMC was acquired by Springer, the world's second-largest scholarly journal publisher. Hindawi is another relatively large commercial open access journal publisher. Hindawi entered the scholarly journals market at a time when academic libraries had no funds available to purchase subscriptions; to some extent, open access was simply a business decision for Hindawi.

Traditional commercial publishers have been making moves towards open access for some time. Initial moves often seem timid or designed to prove that open access is not attractive to authors by deliberately making the open access option unattractive. For example, some of the hybrid subscription / open access models involve charging high article processing fees and offering little in return, such as Elsevier's sponsored article option, which makes articles free to read if the author pays a fee – but only at the Elsevier website.

In recent months, many traditional scholarly commercial publishers, including most of the largest companies, appear to have made serious commitments to compete in what they must see as an emerging open access market. PLoS began by aiming to compete with *Nature*. Today, it appears that Nature is aiming to compete with PLoS.

Nature's new journal *Scientific Reports*, released in 2010, appears to be a clone of PLoS' innovative *PLoS ONE*, a general open access journal aiming for rapid publication of all research articles submitted that meet the criteria of sound research. PLoS ONE became the world's largest scholarly journal in 2010, when the journal published 6,749 articles (Morrison, 2011c). *Scientific Reports* not only follows the same publishing model as *PLoS ONE*, it even has exactly the same article processing fee. *Nature* has also expanded its open access choice options (where authors have the choice of paying to make their articles open access), as well as offering more fully open access journals. The Nature (2011) Publishing Group (NPG) Library Gateway states: "NPG is actively expanding the open access options it offers to authors, with new open access journal launches and open access options on many subscription journals. The first of these models were introduced in 2005, with the addition of open access options on 11 journals in 2009. Further open access options on a number of journals have been introduced in 2010 and 2011".

Springer Open (2011) is an ambitious effort to provide open access journal offerings across all disciplines; Springer Open claims that it will give scholars "the opportunity to publish open access in all areas of science". Wiley has launched a similar initiative called *Wiley Open Access*. Taylor and Francis announced a major expansion of their open access offerings in October 2011, including *Taylor and Francis Open*, which they say will include a "new series of fully Open Access titles from 2012 in major subject areas" (4-traders, 2011).

Laakso, Welling, Bukvova, Nyman, Björk et al. (2011) conducted a study of the growth of open access journals from 1993 to 2009, and described three phases of growth: The Pioneering years (1993–1999), the Innovation years (2000–2004), and the

Consolidation years (2005–2009). Taking into account moves by commercial scholarly publishers into what looks like an effort to seriously compete for an open access marketplace such as those described above, I argue that the present time can be described as the beginning of the Competition Years for open access publishing.

There are positives and negatives to this increase in commercial involvement in open access publishing. On the plus side, while commercial involvement keeps scholarly publishing within the scope of capitalism, the commodity form changes from the article per se to the service of publishing. This service is temporary, leaving the article itself to become a part of the body of knowledge freely accessible to all. That's a very strong plus. Another positive is that entry by traditional publishers into competition for an open access marketplace weakens their efforts to lobby against open access. It is hard to make a strong argument for open access being less valuable when you are competing for open access authors.

One negative is that the possibility of new revenue through article processing fees, one of the business models for open access publishing, is attractive to new publishers with a primary goal of profit. Some of these publishers provide high quality services and are valuable additions to the field of scholarly publishing. An organization called the Open Access Scholarly Publishers Association (OASPA) has been developed, and ensuring quality is one of its goals. The OASPA (2011) *Member Code of Conduct* is instructive in that it suggests some of the issues that must have come up; it states, for example, that "Members should not indulge in any practices or activities that could bring the Association or open access publishing into disrepute" and that "Any direct marketing

activities publishers engage in shall be appropriate and unobtrusive", a code that is obviously directed to spamming.

Open access monographs

Electronic books are a relatively recent development compared with electronic journals, and so it is not surprising that open access monographs are only beginning to appear. Another reason for the delay is the initial focus of the open access movement on the scholarly journal articles that authors traditionally give away, in comparison with monographs where royalties to authors are the norm. One major project is OAPEN (2011), Open Access Publishing in European Networks, which describes itself as a "collaborative initiative to develop and implement a sustainable Open Access publication model for academic books in the Humanities and Social Sciences." Another example is Open Humanities Press.

Open access policy

There are more than 200 open access policies as of 2012. Open access policy is almost invariably focused on green, or open access archives, rather than open access publishing, for two reasons. The first is that open access policies apply to the researcher (or scholar), not the publisher. The second is that green policies support wider choice for the researcher, who can comply with the policy by publishing in either an open access or a toll-based journal, and self-archiving a copy of their article for open access. Green open access policies are consistent with the practices of the majority of publishers.

Research funding agencies, particularly in the medical area, have been early adopters of open access policies. From the point of view of a research funding agency, open access just makes sense; more researchers can read and build on the results of the

funded research, advancing discoveries in the areas that are of priority to the research funding agency. The results of funded research are more visible, enhancing accountability. Often, funding agencies have very limited access to subscriptions to scholarly journals, so open access makes the research more accessible, even to staff at the funding agency.

Medical Research Funding Agencies' open access mandate policies

U.S. National Institutes of Health Public Access policy

The U.S.' National Institutes of Health (NIH), the world's largest medical research funder with a funding portfolio of about $30 billion per year, was among the first funding agencies to develop a voluntary open access policy, with the Public Access policy of 2004 (U.S. N.I.H. 2008a). It should be noted that Public Access is not equivalent to OA. One of the most important lessons from the NIH early adoption was the importance of making open access required, not voluntary; under the voluntary policy, compliance was dismal – only 4% in the first year. This has been remedied, with a strong public access mandate policy coming into effect in April of 2008. Early indications are that making the policy a requirement has been very successful. According to the U.S. NIH (2008b), the total public access for 2005-2007 before the policy was 19% of all NIH-funded articles (12% author manuscripts, 7% publishers' final PDF). Estimated compliance from April to August 2008 was 56% (30% author manuscripts, 26% publishers' PDF).

The NIH requires researchers to deposit a copy of their final peer-reviewed manuscript in PubMedCentral on acceptance for publication. Open access can be delayed for a maximum of 12 months. Many publishers are voluntarily assisting authors in

complying with the policy, making deposits on behalf of authors. Several hundred journals are voluntarily contributing all of the journal contents to PubMedCentral, some immediately, and others after a delay period.

The immediate deposit / optional release strategy is key to a successful open access policy. If there is an embargo, authors are much more likely to be able to find their final peer-reviewed manuscript just as it is accepted for publication, than months or up to a year later. For the research funder, it is possible to monitor compliance with an embargoed article without waiting until the end of the embargo period. That is, if the researcher is submitting an application for further funding during the embargo period, proof of compliance with the requirement for public access can be established. The NIH Public Access policy reflects gratis rather than libre open access, although the NIH does encourage libre OA.

Other medical funding agencies' open access policies

The Wellcome Trust, a private charitable organization, is the largest medical research funder in the U.K. The Wellcome Trust was an early adopter of a very strong policy, *Open and Unrestricted Access to the Outputs of Published Research*. Wellcome-funded researchers are required to deposit a copy of their work for open access in UK-PubMedCentral as soon as possible, but no longer than 6 months after publication. While the U.S. NIH allows up to a 12-month embargo period, a maximum of 6 months is emerging as an international standard. The Wellcome Trust also makes available a fund for article processing fees for open access. Libre open access is encouraged, and when Wellcome Trust funds are used to pay for OA article processing fees, it is required.

Many other funding agencies in the medical area have adopted open access policies, including the U.K.'s Medical Research Council, Canada's Canadian Institutes for Health Research, the Howard Hughes Medical Institute, and Ireland's Health Research Board, to name just a few.

Non-medical research funding agencies' open access policies

The arguments for open access are relatively easy to understand in the area of medical research where the public interest is most obvious. The same arguments apply in every area where public funds are spent on research that is published. Open access serves the interests of the public that funds the research, by speeding up discovery, giving the public rights to access the results of the research that they have funded (taxpayer access). The exception is classified research (which is not published). The public interest arguments are just as compelling in the areas of environmental science, education, or other social sciences, as they are in medical research.

In 2006, a bill called the Federal Research Public Access Act (FRPAA) was introduced in the U.S., which would require every federal department with a funding portfolio of $100 million or more (11 departments) to develop a public access policy. Efforts are currently underway to re-introduce FRPAA or similar legislation. In 2011, the U.S. Office of Science and Technology Policy issued a "*Request for Information: Public access to peer-reviewed scholarly publications resulting from federally funded research".*

France's Agence Nationale de la Recherche (ANR) (National Research Agency), a general science funding agency, with a 2007 budget of 825 million Euros, implemented

an open access policy in 2007 requiring deposit of results of all ANR funded research in a national archive, HAL, at the earliest possible opportunity.

In the UK, all the Research Councils have committed to developing open access policies, and six of the seven councils already have policies in place. The UK Natural Environment Research Council requires that a copy of the published peer-reviewed results of any research they fund be deposited at the earliest opportunity in an e-prints repository; datasets must be deposited in one of their data centres. The SHERPA project maintains a list of Research Funding Agencies' Open Access Policies, called SHERPA JULIET.

Institutional open access mandates

There are over a hundred institutional and departmental open access mandates in many countries; a current list can be found in the Registry of Open Access Material Archiving Policies (ROARMAP).

Australia's Queensland University of Technology was among the first to implement a strong university-wide policy, which states: "Material which represents the total publicly available research and scholarly output of the University is to be located in the University's digital or "E print" repository, subject to the exclusions noted." "Exclusions" include material to be commercialized, or of a confidential nature. The effectiveness of the policy can be seen by a spike in deposits in 2004 (available from the Queensland website), just after the policy took effect.

There are at least two types of institutional open access mandate policy. One type of policy is top-down policy, in which the institution requires that its faculty make their work open access. The Queensland policy is an example of top-down policy. Another type, pioneered by Harvard, is the faculty permissions mandate policy, in which faculty members grant to the university nonexclusive rights to disseminate their work for open access. From my perspective, the latter is the optimum for scholars and hence for scholarship, because in addition to expanding open access, this approach also asserts the rights of scholars to their own work. The first development along these lines was the unanimous adoption of an open access resolution by the faculty of the Harvard Faculty of Arts and Sciences, as reported by Mitchell (2008):

> In a move to disseminate faculty research and scholarship more broadly, the Faculty of Arts and Sciences (FAS) voted Tuesday (Feb. 12) to give the

University a worldwide license to make each faculty member's scholarly articles available and to exercise the copyright in the articles, provided that the articles are not sold for a profit.

I argue that the "not sold for a profit" phrase, while well intentioned, is not optimal, as this leaves the door open to charging on a cost-recovery basis. The policy adopted unanimously by the faculty of the Massachussetts Institute of Technology corrects this deficiency, clarifying that the articles are to be disseminated openly. In my opinion, the MIT open access policy (2009) is the best one to date, and is repeated here in full:

MIT Faculty Open Access Policy

Policy adopted by unanimous vote of the faculty on 3/18/2009:

The Faculty of the Massachusetts Institute of Technology is committed to disseminating the fruits of its research and scholarship as widely as possible. In keeping with that commitment, the Faculty adopts the following policy: Each Faculty member grants to the Massachusetts Institute of Technology nonexclusive permission to make available his or her scholarly articles and to exercise the copyright in those articles for the purpose of open dissemination. In legal terms, each Faculty member grants to MIT a nonexclusive, irrevocable, paid-up, worldwide license to exercise any and all rights under copyright relating to each of his or her scholarly articles, in any medium, provided that the articles are not sold for a profit, and to authorize others to do the same. The policy will apply to all scholarly articles written while the person is a member of the Faculty except for any articles completed before the adoption of this policy and any articles for

which the Faculty member entered into an incompatible licensing or assignment agreement before the adoption of this policy. The Provost or Provost's designate will waive application of the policy for a particular article upon written notification by the author, who informs MIT of the reason.

To assist the Institute in distributing the scholarly articles, as of the date of publication, each Faculty member will make available an electronic copy of his or her final version of the article at no charge to a designated representative of the Provost's Office in appropriate formats (such as PDF) specified by the Provost's Office.

The Provost's Office will make the scholarly article available to the public in an open-access repository. The Office of the Provost, in consultation with the Faculty Committee on the Library System, will be responsible for interpreting this policy, resolving disputes concerning its interpretation and application, and recommending changes to the Faculty. The policy is to take effect immediately; it will be reviewed after five years by the Faculty Policy Committee, with a report presented to the Faculty.

> The faculty calls upon the Faculty Committee on the Library System to develop and monitor a plan for a service or mechanism that would render compliance with the policy as convenient for the faculty as possible.

Key elements of good open access policy:

• open access is required, not requested. There are publishers who oppose open access, and will take advantage of any loophole to make it difficult for their authors to comply with a policy.

• calls for archiving (green) open access. This is inclusive of open access publishing, as an article published in an open access journal can also be deposited in an open access archive

• immediate deposit / optional delayed release – if an embargo or delayed is permitted, authors should deposit as soon as their article is accepted for publication. It is much easier for authors to find the appropriate copy at this point in time, and much easier to check on compliance.

• keep embargoes to the minimum necessary – 6 months is an emerging standard internationally, and include language to review the policy with a view to decreasing or eliminating the embargo

• include support for implementation whenever possible, such as commitment to build an institutional repository, or support for open access publishing, effective procedures for monitoring and rewarding compliance

Summary

Open access is scholarly literature that is digital, online, free to read and free of most copyright and licensing restrictions. Open access can be green, when authors self-

archive their work for open access, or gold, when the publisher makes the work open access. Open access can be gratis (free to read) or libre (free to read and to reuse). Open access can apply to the works themselves, or to the process of making works open access. When a publisher or journal provides free access to back issues, this is best described as free back issues. Once the articles themselves become free, it is appropriate to refer to the article (but not the journal or the publisher) as open access. There are interrelationships between open access and many other "open" movements and initiatives, such as Creative Commons. Although open access is a simple concept, fully articulating what it means in a way that ensures a sustainable knowledge commons will take further analysis.

The growth of open access is dramatic. There are millions of open access items in institutional and disciplinary repositories, and over seven thousand fully open access, peer-reviewed scholarly journals. Open access is one means of fighting the enclosure of knowledge that has seen considerable success over the past few years. The commercial sector is highly involved in open access publishing, a tendency that is increasing, however even in this situation, with full open access publishing, the commodity becomes the publishing service, freeing the work.

Chapter 4: Economics of Scholarly Communication in Transition

> Prices that libraries pay for subscriptions vary widely among journals; for physics and mathematics publications the cost per character varies by as much as a factor of 40 (Barschall, 1986).

This seemingly innocuous sentence is the beginning of Barschall's *The cost of physics journals*. Scholarly publisher Gordon & Breach, reported in this article to be the most expensive of physics publishers, did not react well to this statement. They sued Barschall and the publishers of this and a related article, American Institute of Physics (AIP), and the American Physical Society (APS), in four countries, refusing to follow normal scholarly practice of publishing a refutation in the journals where the initial results were published. The lawsuits lasted for over a decade. Barschall, AIP, and APS were exonerated after Barschall's death, as recorded by Lustig (2001). Gordon & Breach no longer exists, having been acquired by Taylor & Francis, now owned by Informa.plc, but Barschall's articles are still readily accessible from a Stanford University and Yale University (1997) website which also details the court cases.

Things are looking up for the scholar of the economics of scholarly communication. There are still plenty of challenges to locating Information. Most scholarly journals are now sold in bundles, often through license agreements that contain nondisclosure agreements, making the kind of per-journal comparison done by Barschall very difficult. Financial Information for shareholders of large commercial companies is readily available, but not necessarily easy (or even possible) to parse out for economics analysis, and financial Information for privately owned scholarly publishers is not

necessarily available at all; this is generally seen as confidential, proprietary Information. Amalgamated Information is available through a company called Outsell – but at prices like $1,295 for Mark Ware's latest 22-page report on *Scientific, Technical and Medical Information: 2011 Market Forecast and Trends report* (Outsell, 2011), this researcher will do without. Then there is wrapping your mind around all of the resources that go into scholarly communication, on a global basis. But thanks to the courage and persistence of Barschall, AIP, and APS, it appears to be possible to do research in this area without fear of being sued.

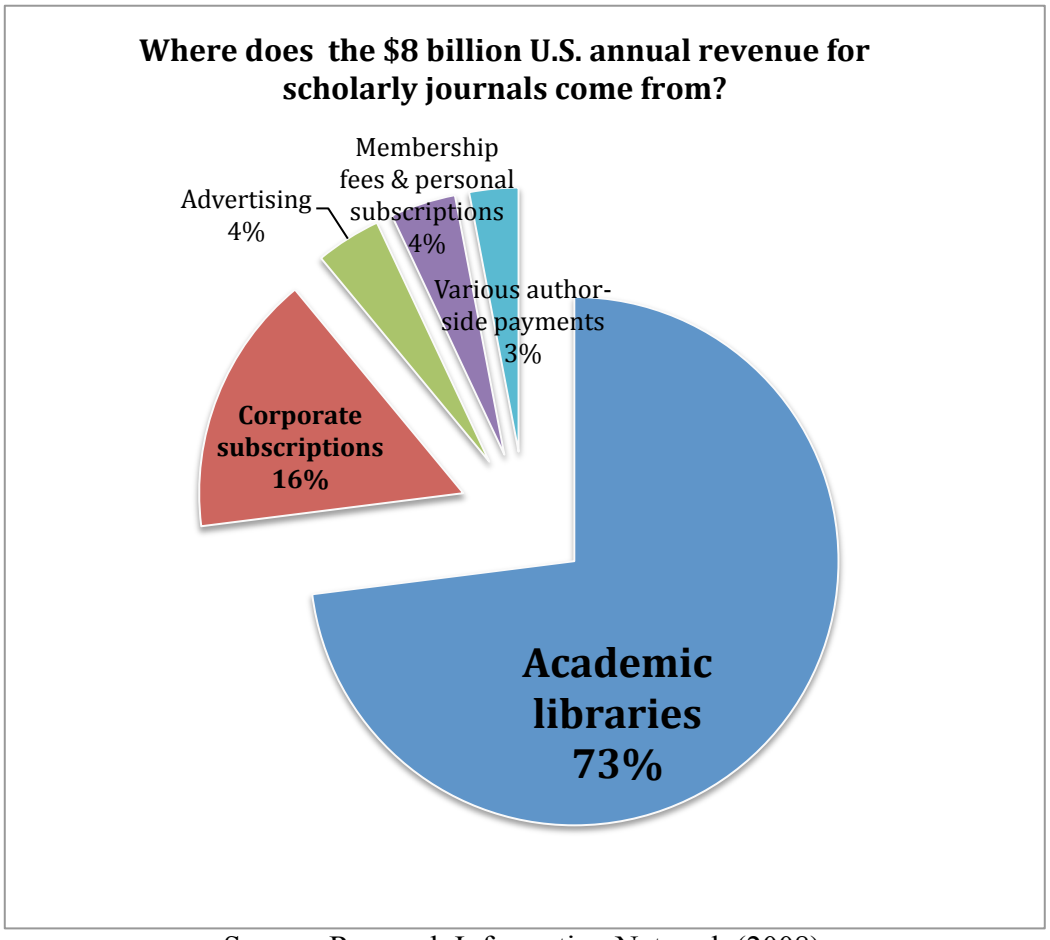
Academic library budgets sustain scholarly journal publishing

This is a key point in understanding the economics of scholarly journal publishing. Universities, and, to a lesser extent, research organizations, have long been the main producers and the main consumers of the scholarly journal literature, with the revenue flowing through their organizational libraries to publishers. With electronic media, "the contradiction between producers and consumers is not inherent; on the contrary, it has to be artificially reinforced by economic and administrative measures", as Enzensberger pointed out in 1974 (p. 106). In terms of scholarly publishing, these artificial measures are the academic reward system which artificially props up the entrenched commercial scholarly publishing industry by requiring publication in high impact factor journals, and the inelastic market that keeps the commercial interests engaged due to above average profits, as we saw in chapter two.

Michael Mabe (2011), CEO of the International Association of Scientific, Technical and Medical Publishers (STM), recently affirmed that about 80-90% of the $8

billion in revenue that goes into production of the world's peer-reviewed scholarly journals comes from library subscriptions, as reported by Ware and Mabe (2009, p. 16). Ware and Mabe's analysis is based in part on research by the Research Information Network (2008), which found that journals publishing revenues are generated primarily from academic library subscriptions (68-75% of the total revenue), followed by corporate subscriptions (15-17%), advertising (4%), membership fees and personal subscriptions (3%), and various author-side payments (3%).

Figure 6: where does the revenue for scholarly journal publishing come from?



Source: Research Information Network (2008)

Because universities are both the primary producers and consumers of scholarly journals, this suggests the possibility of transitioning economic support from the demand (subscriptions) to the supply (publishing services or journal production) side. There are two basic models for accomplishing this transition, with a number of variations. One model involves taking on production services (university / library press model). The other model involves paying for production services, such as open access article processing fees.

There are significant challenges to making a transition of this nature. Currently, academic library budgets are largely tied up with subscriptions to "must-have" journals, leaving little flexibility to shift support to open access. The vast majority of journals are still sold on a subscriptions basis. A global shift to open access publishing requires publication outlets in sufficient numbers and of sufficient quality to meet the needs of all scholars. A global shift from demand to supply side takes global commitment and participation on the part of libraries, scholars, and publishers alike. Despite the challenges, there are many signs that this transition is already well underway, such as the *Dramatic Growth of Open Access* reported in the previous chapter, and the library publishing operations mentioned in the second chapter. One of my central arguments is that a prudent transition of academic library budgets from support for subscriptions journals to support for open access publishing will be key to a successful transition to open access.

Other revenue sources

Academic library budgets would not be the sole source of revenue in an open access future. As noted in the Research Information Network (2008) report, 15-17% of

revenue for scholarly journal publishing comes from corporate subscriptions. These corporate subscriptions will include some research organizations, and it makes sense to assume that these will contribute to paying for the production of the results of the research that they conduct. Research grant funds can often be used to pay for open access article processing fees. The Wellcome Trust has created a fund especially to pay for such fees. Many research funding agencies have long provided researchers with an option to use funds for dissemination of results. For example, the U.S. National Institutes of Health (2005) calculated that it made available about $30 million annually to its grantees for publication and page charges. The Canadian Institutes of Health Research has long had a policy that funds could be used for dissemination purposes. Library and university based publishing outfits can take advantage of local infrastructure such as servers and internet connectivity. As Edgar and Willinsky (2010) note, there are also substantial sources of subsidy funding available to many scholarly journals.

Affordability

A healthy scholarly journal publishing system, in addition to providing open access, must be affordable. As discussed in the second chapter, the background to the transition to open access is a growing, entrenched commercial scholarly publishing sector earning significant revenue and profits. This section will address some of the major elements necessary to ensure that scholarly journal publishing will be affordable into the future.

How many journals, and how many articles?

To calculate the affordability of different options for scholarly journal publishing, one needs to know, at least approximately, how many journals and articles are produced on an annual basis. Björk, Roosr and Laurie (2008) calculated that the 23,700 journals listed in Ulrich's as of 2008 published approximately 1,350,000 peer-reviewed journal articles in 2006[8]. These are the figures and timelines used for the calculations in this chapter, recognizing that both journal article production and revenues have increased since that time.

Cost per article as a key metric

It takes resources to publish a peer-reviewed scholarly article, such as time spent editing and coordinating peer review, hardware, software, and connectivity for an online journal. The costs in dollar terms vary a great deal. Willinsky (2006) explored the costs per article of scholarly publishing in some depth and found a cost range from zero to $20,000 per article. Willinsky (2006, p. 69) quotes Gene Glass, founder of the online-only *Education Policy Analysis Archives* (EPAA) in 1993 as describing EPAA's budget

[8] As of 2011, by my calculations Ulrich's lists approximately 26,000 active, academic / scholarly journals (Appendix C), approximately a 10% increase over 2006. Assuming that there is no difference in the average number of articles published per journal, an estimate of just under 1.5 million peer reviewed articles published per year seems reasonable. Ulrich's list contains predominantly English-language titles, and may reflect a western bias. For example, Chinese academic journals are likely underrepresented in Ulrich's. According to Jie (2010): "China has almost 9,500 academic publications that generate about 2.5 million papers per year, according to Shen's figures. But there are 30 million teachers, lecturers, students, technicians and researchers seeking publication". It is assumed that this is of limited relevance to the present exercise, as any bias in Ulrich's coverage is likely matched by a bias in purchasing. That is, this analysis is predominantly a western-based, developed world analysis.

as "Zero, *nada*, no budget, no grad assistant, no secretary." This is possible in scholarly publishing because of the large percentage of the work that is done on a voluntary basis by scholars paid through university salaries, and in-kind support that is generally available at universities, such as computers, software, and connectivity.

This is a marked contrast with the scholarly journal publishers' annual collection of about $8 billion US in revenue. Of this amount, as noted above, about 68-75% of the total ($5.4 - $6 billion) comes from academic library budgets. The substantial profits of the large commercial scholarly publishers, typically in the 30-40% range, suggests that there is more than enough funding in the current system from the academic libraries alone than is necessary to fund the costs of publishing. I argue that this amount is more than sufficient to fund reasonable publication costs for all of the world's scholarly peer-reviewed journal articles, but not necessarily the levels of profits that certain publishers are accustomed to collecting.

A key metric to assess efficiency in an open access environment, I have long argued, is the average cost per article. From 2004 to 2005, I conducted an ad hoc thought experiment called *The Imaginary Journal of High-End Chemistry*, exploring the necessary costs of publication through listserv and blog postings, incorporating feedback from scholarly publishers, librarians, and chemists (Morrison, 2005). The basic argument was that $500 per article should be sufficient to cover the necessary costs of online-only, fully open access publishing, even assuming well-paid staff working in a costly environment (Vancouver, British Columbia).

In 2004, The Wellcome Trust published the report, *Costs and business models in scientific research publishing.* After reviewing the literature on costs of scholarly publishing and discussions with senior staff at a range of publishers (including commercial publishers), the Wellcome Trust concluded: "A conservative estimate of the charge per article necessary for author-pays journals lies in the range $500–$2500, depending on the level of selectivity used by the journal, plus a contribution to overheads and profits" (p. 2).

Today's actual article processing fees (APFs) of successful, established fully open access publishers supports these predictions of The Wellcome Trust and from *The Imaginary Journal of High-End Chemistry*. The profitable Hindawi charges fees closer to the low end of the range. For example, the APF for Hindawi's Economics Research International is $400. BioMedCentral's average APF is $1,895, in the middle of the range. PLoS fees range from $1,350 for PLoS ONE to $2,900 for PLoS Biology. This is just over the top of the Wellcome Trust range - but then seven years has intervened between the publication of the report and now.

It is important to note that the Wellcome Trust cost estimates assume a largely commercial scholarly publishing system. Edgar and Willinsky (2010), surveying the group of journals using Open Journal Systems, mostly published by independent scholars, found an average cost of $188 per article.

The importance of cost per article in determining whether an open access scholarly publishing system is feasible from an economic standpoint is implicit in the conclusions of Walters (2007). Walters studied the economic implications for a switch to

open access for a range of institutions from small colleges to a large research university with two models, a PLoS model and a model assuming maintaining current revenue streams for scholarly publishers.

Walters found that all institutions would save money with a PLoS model, with an average cost per article of $1,500. Walters also found that this model shifts the proportion of costs, so that the large research university pays a higher share of the cost than with the present system. However, the savings from the PLoS model are so substantial (only 15% of the revenue that goes into scholarly journal publishing at present, by Walters' calculations), that even the large research university saves about half its journal costs with this model. The other model Walters looked at assumed maintenance of current revenue for publishers; with this model, most institutions would still enjoy savings by Walters' calculations, however the total cost would increase for the large research university library.

My focus is transforming the scholarly publishing system, towards a system that responds to the needs of scholars for Information rather than the needs of investors for profits. I will not explore the model which projects current revenue for publishers, but rather focus on the potential for a more affordable future for scholarly journal publishing.

Figure 7: comparison of current costs per article in U.S. $

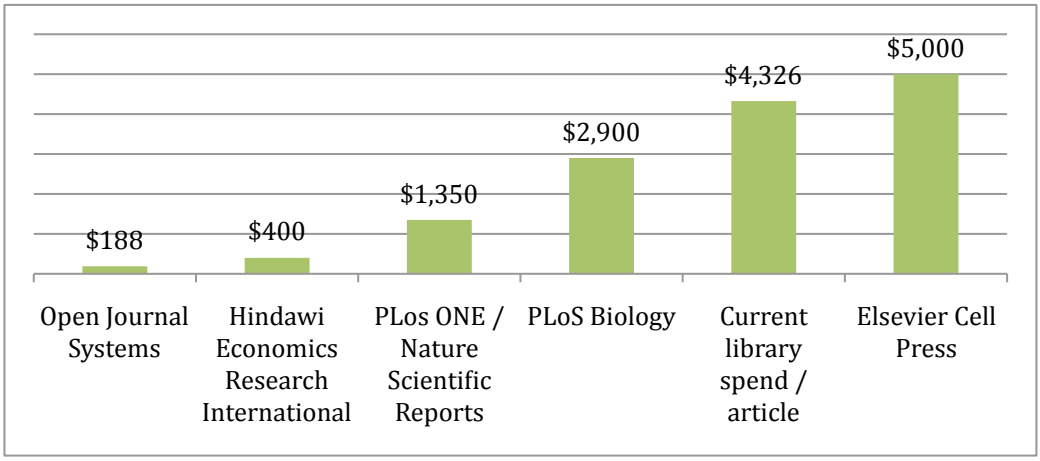


Figure 7 compares current library spend per article with several open access per-article costs. The estimate of $4,326 current library spend per article is calculated on the basis of the $5.8 billion estimated annual academic library spend per article, divided by the estimated 1,350,000 peer-reviewed articles per year calculated by Björk, Roosr and Laurie (2008) for the 23,700 journals listed in Urlich's as of 2008. This amount is contrasted with several current per-article costs for open access journals, as discussed above. The costs on a per-article basis for many fully open access journals are considerably less than the current library spend. Elsevier's (2012) Cell Press, a hybrid "open access" choice (technically a "sponsored article" choice, not really full open access), is an outlier with a cost that is higher than the current average library spend.

Table 1: Global costs and library cost savings with transition to open access

	Cost per article	Global cost 1.35 million peer-reviewed articles ($ millions U.S.)	Global library cost savings ($ millions U.S.)	Global library cost savings in %
Open Journal	$188	$254	$55,862	96%

Systems				
Hindawi Economics Research International	$400	$540	$5,300	91%
PLos ONE / Nature Scientific Reports	$1,350	$1,800	$4,017	69%
PLoS Biology	$2,900	$3,915	$1,925	33%
Current library spend / article	$4,326	$5,840	$0	0%
Cell Press	$5,000	$6,750	-$910	-16%

Table one illustrates that, given realistic average per-article costs, academic libraries, by working together globally, could fully fund the scholarly peer-reviewed journal system – and save money, too. The columns illustrate the essential point about cost per article being a key metric to assess the affordability of the system. At the Open Journal Systems average cost per article of $188, the total cost globally would be $253 million. Academic libraries could fund this amount from current budgets and still achieve a global cost savings of $5.5 billion annually, or 96% less than current spend. This largely scholar-led system would be by far the most cost-effective means of transitioning to open access.

The $400 fee of Hindawi's *Economics Research International* shows that highly significant cost savings are compatible with cost-efficient for-profit publishing.

At the PLoS ONE (or Nature *Scientific Reports*) average cost of $1,350, cost savings would be about 70% with a global transition. At the PLoS Biology rate of $2,900 per article, the total cost to academic libraries would be $3.9 billion, a cost savings of

$1.9 billion annually, or 33% less than current spend. On the other hand, if the average cost were the Elsevier – *Cell Press* fee of $5,000 per article, this would *add* close to one billion dollars in library spending, or a 16% increase in global library spending on scholarly journals.

This table illustrates the importance of cost per article as a key metric in transitioning to an affordable open access scholarly publishing system. Libraries could support a largely scholar-led journal publishing system at a very small fraction of current spend, as illustrated by the Open Journal Systems average cost of $188 per article. Significant cost savings could be achieved at rates currently charged by for-profit Hindawi, or the not-for-profit Public Library of Science. However, average costs in the $5,000 range as currently charged by Elsevier's *Cell Press* would increase the cost of the system as a whole.

Cost per book

In 2008, Greco and Wharton recommended an open access model for university presses, suggesting an approach similar to article processing fees, with a $250 submission fee, an additional peer review fee of $250 to send books successful at the submission stage out for peer review, and another approximately $10,000 or so for final typesetting, copy editing, and so forth, for a total of approximately $10,500. An interviewee (Morrison, 2012) with decades of experience in university press monograph publishing provided me with a ballpark first copy cost estimate for an electronic open access monograph of $15,000.

Pinter (2011), a publisher with decades of experience and founder of Bloomsbury Academic Press, calls for libraries, publishers and consortia to work together to fund open access monographs, citing a first copy cost of $10,000. Pinter's model assumes that publishers would earn additional revenue streams, through sales of print on demand or specially formatted e-books.

If cost savings from a flip to open access at an average rate of $1,500 per article were redirected to fund monograph publishing, this would provide up to $3.8 billion annually to fund open access monographs. This amount would be enough to pay for the creation of 250,000 open access monographs per year. That would be a quarter of a million more monographs available to everyone, everywhere, added every year. I see libraries as playing an essential role in hosting and preserving these monographs, and ensuring that they are both findable and accessible on a long-term basis. This would be a marked contrast with the current situation where each scholarly monograph sells on average 400 copies.

Issues and challenges with switching to production-based economics

Many of the issues and challenges with respect to journal articles are described by Shieber (2009). Open access journals face an inequitable situation, with the majority of library budgets being committed to subscriptions journals. Hybrid journals are problematic for libraries due to double-dipping, that is, journals charging both article processing fees and for subscriptions. There is a need to establish a suitable cap for open access article processing fees, although Shieber suggests it may be more appropriate to establish caps by author rather than by the article. Beall (2011) has written about the

problem of what he calls predatory open access publishers. That is, the article processing fee approach to open access publishing has opened a door for new publishers, including some that appear to be running outright scams, collecting money for article processing fees without actually conducting peer review. In addition, some have been known to use unethical business practices, such as listing people on their Editorial Boards unbeknownst to the person listed and spamming potential authors and reviewers[9]. Funding agencies are supportive of open access; many have policies requiring open access to the results of research that they fund. Funder generosity in allowing funds to be used to support open access publishing is welcome, however over-generosity could be problematic. For example, if a funder committed to paying open access article processing fees up to $3,000, it is likely that many publishers would set their fees accordingly. Corporate publishers would have a duty to their shareholders to adjust fees accordingly, as charging less would result in less than optimal profits to the shareholders. The result could easily be a standard open access article processing fee that would be higher than what is actually necessary for publishing. This would tend to result in a systemic increase in costs, and would impact authors and other funding agencies less able to match the payment. For this reason, I advocate that funding agencies adopt one of the following policies:

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[9] While I consider Beall's list a valuable service, I would like to note that I do not agree with his assessments of all the publishers listed. For example, Beall places Medknow Publications on a suspect list; Medknow's publication program began with long-established and highly regarded peer-reviewed scholarly journals from India. My comments can be found in Morrison (2011b).

- Allow grantees to use funds for dissemination of research without specifying how funds are to be used. This gives the grantee an incentive to look for affordable alternatives to keep other funds free for other purposes.
- Cap the eligible fee for open access article processing at an affordable amount. For example, PLoS ONE has shown that it is possible for a San Francisco-based professional publisher to produce peer-reviewed articles at $1,350 per article.
- Create funds to subsidize journal publishing along the lines of Canada's Social Sciences and Humanities Research Council's *Aid to Scholarly Journals* program.

Perhaps the biggest opportunity or challenge is the need for collective action. Taylor, Morrison, Owen, Vézina, and Waller (2011), in a survey of libraries and university presses that asked about economic models for support for open access publishing, found that the model most likely to be supported (and not opposed by any respondents) was a library consortial approach.

Collective action: immanent to the online environment?

The business models for scholarly communication in print format are very familiar and easy to understand. Scholarly articles are bundled into journals and sold as annual subscriptions. Scholarly monographs are sold by the copy. In both cases, the copy belongs to the purchaser, who is free to keep, lend, sell, or give away the copy. A copy can only be read by one reader at a time. If the library's copy of the book is on loan, the would-be reader either has to wait for the library's copy or find another one. The

university library retains copies of both books and journals and assumes responsibility for preservation.

Scholarly communications (journals, books, and emerging formats) in the online environment come with a different set of opportunities and challenges. The default "purchase" has changed from sale to leasing or licensing, increasing the danger of Information enclosure discussed in chapter two. Rather than selling subscriptions to individual journal or book titles, it is easy to sell bundles, and many publishers do. One example is the "big deal" of for-profit STM journal publishers which, as we saw in chapter two, is capturing a disproportionate share of the money available for scholarly communication and is a major factor in the serials crisis. The not-for-profit sector has reacted and created aggregations of its own, such as Project Muse. Aggregations can involve journals of many publishers, and even many different types of publishers, for example the general journal packages sold by companies like EBSCO and ProQuest.

The tendency towards aggregation is happening on the purchasing as well as the sales sides. A library can purchase a sitewide license to a bundle of journals for access by any student, faculty or staff member, whether on or offsite. This can impact the individual subscriptions of a publisher, and even the memberships of a not-for-profit society publisher that has traditionally considered receiving a copy of the publication as a membership benefit. A whole class can download and read an article or book at the same time. A library consortia can purchase a copy of a book, journal, or package, for access by students, faculty and staff at every research library in a country. Library consortia occasionally make purchases at an international level, coordinated by *The International Coalition of Library Consortia*. While a few publishers have flourished in this

environment, others are struggling to figure out the economics for survival. Obviously, selling one copy of an ebook for sharing by the whole world at a price that made sense for a single print copy just won't work. There are many successful models for selling scholarly communication in electronic format, such as differential pricing based on size and/or type of an institution, whether measured by Carnegie classification or student numbers. However, if there are no funds left in library budgets after paying for the big deals of the large STM publishers, other publishers may face cancellations.

These dual tendencies towards aggregation on the sales and purchasing sides suggest an immanent potential of scholarly Information in the online environment towards something like ubiquitous or open access. With open access, one copy can be placed online for access to anyone, anywhere with an internet connection. As Sutton (2011) expresses it, free may be inevitable for scholarly communication. It is the process of enclosure that initially takes effort and energy, developing the paradigm of intellectual property and means of enclosure such as digital rights management.

It appears as though the tendency towards aggregation by both publishers and libraries is converging towards open access. If all of the works of a publisher, the "big deal" are available to researchers at every university in a country, this may seem similar to open access, and occasionally people will refer to this as open access.

Elsevier (2011) even has a term for this: universal access. The basic idea is that if everyone who can afford to subscribe or pay-per-view to Elsevier's resources does, and this is supplemented by a little bit of charitable access, then everyone has access. On the surface, this sounds somewhat plausible. At many libraries, the online environment has

meant greatly expanded access. Many a small library has greatly expanded their journal offerings in the online environment.

The major problem with this is who owns the Information. Elsevier is a corporation, an organization with a mission of maximizing profits to shareholders. As long as Elsevier continues a policy of full copyright transfer by authors, Elsevier is free to define the payment terms of its universal access. That is, everyone can have access – provided that they are willing to pay on Elsevier's terms. Or, Elsevier could abandon this approach altogether in favor of another seen as more profitable. If Elsevier is generally selling sitewide licenses to libraries rather than pay-per-view, it is much more likely because this is how Elsevier reaps the most financial benefit, not because pay-per-view is less compatible with universal access. As discussed in chapter two, in 2010 Elsevier made £724m ($1.1 billion) on revenues of £2 billion. What if a wealthy country or group of countries (or even a group of oligarchs) were to offer Elsevier £3 billion annually to provide them with *exclusive* access to the works owned by Elsevier?

My perspective is that commercial "universal access" is problematic at best, and it makes much more sense to build a knowledge commons accessible to all. There may well be a role for the commercial sector here, but the role should not be that of ownership of the scholarly works.

Collaborative approaches

Scholars, libraries, publishers, and consortia are involved in a wide variety of collaborative efforts to transition scholarly communication. Following are just a few examples designed to illustrate the breadth and scope of these initiatives. RePEC (2011),

Research Papers in Economics, describes itself as "a collaborative effort of hundreds of volunteers in 75 countries to enhance the dissemination of research in economics". The *Stanford Encyclopedia of Philosophy* (SEP) is a project led by philosophy scholars, who created their own high quality subject encyclopedia, with entries invited by subject experts and kept up to date. SEP has been working towards creating an endowment to fund ongoing open access, assisted by The International Coalition of Library Consortia (2005), among others.

Libraries have formed a *Compact on Open Access Publishing Equity* (2011), as a means of beginning to address the problem of supporting open access while library budgets are still tied up in subscriptions. The *Synergies* (2011) project has brought together libraries and university presses across Canada to develop a common platform and support for online hosting of Canadian academic journals, particularly in the humanities and social sciences.

A group of open access publishers has formed an association called the *Open Access Scholarly Publishers Association* (OASPA). *BioOne* and *Project Euc*lid are cooperative societies whose publisher members benefit from the economies of scale made possible by working together, as described by Crow (2006). Both *BioOne* and *Project Euclid* feature a mix of fully open access journals and publishers, subscription-based journals, and in-between models such as journals that make back issues freely available.

The arXiv initiative, developed and much used by researchers in physics, mathematics, and several other disciplines, is hosted by Cornell University Library, has

18 mirror sites around the world, and is presently in the process of finessing a sustainability strategy involving support by the institutions that are the heaviest users of arXiv. As of October 2011, 129 institutions from 16 countries had pledged support of $382,000 in contributions for 2011 (arXiv 2011). arXiv hopes to eventually receive support from the 200 institutions around the world that are the heaviest users of the service.

SCOAP3, the Sponsoring Consortium for Open Access Publishing in Particle Physics, is a global collaboration designed to transition library subscriptions in high energy physics to open access. As of December 2011, SCOAP3 has obtained sufficient library commitments for this task, and is in a tendering process with publishers.

OAPEN (2011) describes itself as

> a collaborative initiative to develop and implement a sustainable Open Access publication model for academic books in the Humanities and Social Sciences. The OAPEN Library aims to improve the visibility and usability of high quality academic research by aggregating peer reviewed Open Access publications from across Europe.

OAPEN is only one of a number of European-union wide cooperative open access initiatives.

Houghton and colleagues have conducted major macroeconomic analysis of the potential for transition from subscriptions to open access at the country level, first in the U.K. (Houghton et al, 2009a), and more recently in the Netherlands (Houghton et al,

2009b), and Denmark (Christoffersen, 2009), indicating significant cost savings from a transition to open access in all countries studied. These studies included a broad range of factors involved in scholarly communication, including unpaid activities such as reading and reviewing. The significance of these studies is that they illustrate the financial advantage of even a unilateral move by one country to open access, including countries such as the U.K. where a favorable balance of trade is enjoyed due to high profits of local publishers. The amount of savings varied with the method of providing open access, with the gold approach or open access publishing providing the smallest savings, green or self-archiving greater savings, and the greatest savings were anticipated with a more radical transition of the whole scholarly publishing system to one involving publishing through institutional repositories with a peer-review overlay.

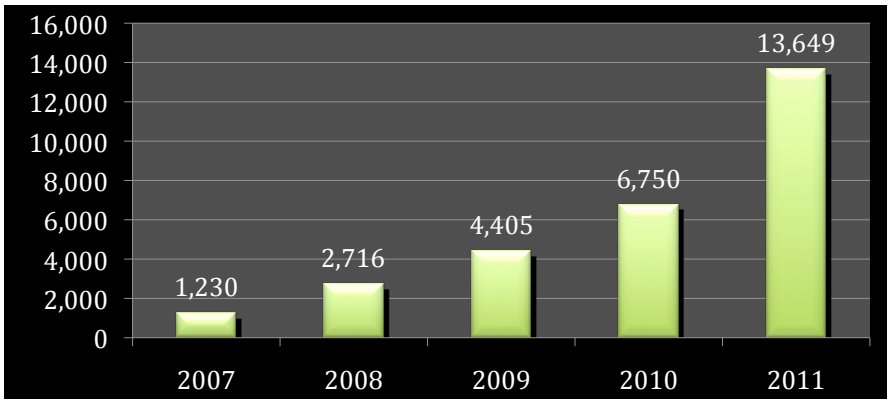
One radical transition: rise of the megajournal

We are beginning to see signs of a more radical transition, away from the format of print. What is most surprising about this transition is that it is taking so long. Odlyzko predicted the impending demise of the journal as long ago as 1994.

One striking shift in scholarly publishing of particular importance to the economics of scholarly publishing is the rise of the megajournal. PLoS pioneered this approach with PLoS ONE in 2006. Rather than filtering articles for scope or interest to readers, a practice that makes sense when journals are issued in print and so must be bundled into issues of a predictable size, PLoS ONE accepts all sound science, all articles that pass peer review, in any discipline. This approach introduces important efficiencies into scholarly publication. Generally, the practice has been for authors to submit a paper

to first one journal, then another if rejected by the first journal, sometimes for several rounds. Each rejection is costly for the rejecting journal, and adds overall to the time of scholarly editors and reviewers, as many articles end up being reviewed more than once. It is likely the efficiencies of PLoS ONE that have made the $1,350 article processing fee (in contrast with the PLoS Biology fee of $2,900) a possibility. In 2010, PLoS ONE became the world's largest journal, publishing close to 2007 articles that year (Morrison 2011c). In 2011, PLoS ONE doubled its output, publishing close to 14,000 articles. One of every 60 articles indexed in PubMed is now a PLoS ONE article. PLoS ONE also appears to have inspired a number of new megajournals (Konkiel, 2011). Size is only one of the innovations of PLoS ONE, which also features post-publication peer review and article-level metrics.

Figure 8 Number of articles published in PLoS ONE per year, 2006 – 2011.



Source: Morrison (2004-) *The dramatic growth of open access*.

Considerations for the developing world

Authors in the developing world are expected to publish in the top international journals; from an economics perspective, this is not optimal for the developing world, as

discussed by Merrett (2006). Local publishing would be more affordable, as it would allow scholars and universities to take advantage of a lower cost of living. Local publishing would also provide academic leadership and business opportunities for the developing countries. Local journals would also be more receptive to research on topics of local interest, such as illnesses that are common in the developing world but rare in the developed world. For those developing world authors who do wish to publish in international journals, the International Network for the Availability of Scientific Publications (INASP) has created a program called AuthorAID, which helps developing country writers with their writing.

Summary

There is more than enough revenue to fund an open access scholarly publishing system. Transitioning the major source of support for scholarly journal publishing, library journal subscriptions, will be key to a successful transition. A prudent transition seeking affordable scholarly journal publishing has the potential to provide academic libraries with significant savings, which could fund redistribution of economic support for scholarly publishing, particularly to reinvest in scholarly monograph publishing. A key metric in understanding affordability in scholarly publishing in an open access environment is the cost per article or cost per book. Cooperative solutions have been emerging in scholarly publishing for some time, and will be important in the transition to full open access. The most cost-effective approach to the transition will involve a more radical transition away from the print format. There signs that such a transition is beginning, with the rise of the megajournal pioneered by PLoS ONE.

Chapter 5: Scholarly communication and the discipline of communication

The initial focus of the open access movement was on scholarly journal articles (rather than monographs or other forms), for the practical reason that scholars have traditionally given away both their articles and their peer-reviewing services, as discussed in chapter three. The initial focus of the open access movement has also been on science, technology, and medicine (STM), for the practical reason that the high cost of journals in these areas is problematic for the whole system of scholarly communication, as discussed in chapter two. For this reason, the humanities and social sciences as a whole, including the discipline of communication, has not received the same level of attention as STM.

I argue that scholarship in humanities and social sciences is every bit as important as scholarship in STM, and for this reason open access to our scholarship is just as important, too. The example of the participatory action research study published in a toll-access journal, inaccessible to the young aboriginal women who served as participants and many of those who might wish to help them, from chapter two, is just one illustration of how the important work done by communication scholarship could be more effective if it were openly accessible.

Critical views: a literature review and critique

Communication scholars have much to contribute to the theoretical and economic analysis work identified as necessary for the transformation of scholarly publishing in chapter two. This section highlights the contributions of a few critical communication scholars to date.

Merrett (2006) covers the basics of the impact of the commercial sector on scholarly publishing, discusses massive profits from scholarly publishing that international commercial publishers benefit from, in spite of adding little value to the

publishing process, and that one effect of price increases for commercial "big deal" packages including essential journals, especially in the science, technology and medical (STM) areas, has been a decrease in funding available for purchase of other journals and scholarly monographs.

Pirie (2009) affirms much of the information provided by Merrett. Pirie points out that the scholarly publishing industry can be considered a failure even in neoclassical economic terms, with operating profits of the largest commercial publishers in the range of 24-45 percent, in comparison to the average U.S. manufacturing firms' profit of 7.1 percent (Bank of Korea, 2007), reflecting a lack of competition. Pirie suggests that mainstream criticism of this situation is limited in that it does not take into account the broader political economic context. In particular, Pirie is highly critical of May (2005) who views alternative open source and open access publishing as capitalist in nature, just *differently* capitalist, combining elements of public good within a basically capitalist system. May (2010) argues that open access is not a revolution, but rather a further development of the struggle to balance public and private interests. Pirie (2009) claims that May's article is "fundamentally atheoretical, accepts some of the claims made by academic publishers uncritically, fails to engage in an in-depth analysis of the structure of the journal-industry, and makes highly suspect recommendations for reform."

Pirie's analysis is based on the UK, or more broadly the core English-speaking capitalist countries including primarily the UK and the U.S., as well as the Netherlands, a limitation that Pirie acknowledges. The UK academic journal industry is highly competitive and a net exporter, and is worth about £1 billion annually to the UK economy. Pirie discusses the need for capital to find new areas of accumulation based on

intangibles rather than physical production, and the increasing marketization of the public sphere since the 1970's. Pirie questions whether approaches that seek to modify capitalism have any chance of success, predicting strong opposition from capitalism as a whole, and suggests that change needs to come through a broader movement away from capitalism to socialism. According to Pirie, there are two options for scholarly publishing: the commercial system and state support. Pirie recommends a state-supported system of open access journals.

I would argue that Pirie's analysis is excessively essentialist in nature, with a narrow focus on the benefits of the current system for capitalism but missing a very important point: the business community is part of the public that is denied access to the results of work funded by the public under the subscriptions model. It is true that the business community can purchase access to subscription journals or articles, however, the price barrier is sufficient to discourage such access, and, since the business community contributes to the production of the information through their taxes, they should not have to pay again to read the results.

While competition is lacking *within* the scholarly publishing industry, the interests of this industry are also in conflict with the interests of other industries. If the university library is forced to pay large sums to access scholarly journals or do without, so are the pharmaceutical company, the oil company, and the entrepreneur who is looking for new environmentally friendly business ideas. In this context, contesting the commercialization of scholarly publishing does not threaten capitalism as a whole, but rather pits the interests of one small group of publishers against a great many other capitalists. Polanyi (1957, p. 132) touches on this paradox when he points out that even the organization of

capitalist production needs shelter from the self-regulating market. This situation presents an opportunity to mobilize capitalist support for open access, a move that may incidentally protect and expand the public sphere.

According to Pirie, the one essential role of commercial publishers is funding the publishing process; all other functions from authoring to reviewing to editing are performed by academics. If an alternative source of funding could be found, the role of the commercial publishers could be done away with immediately. Pirie's suggested remedy is central state support through the UK research councils for scholarly journals. I argue in the previous chapter that a key source of alternative funding involves redirecting funds from academic library budgets. The strong centralization of library services such as purchasing (for example, through the Joint Information Systems Committee) suggest that this distinction may not be as relevant in the U.K. as it is in other regions.

The RIN (2008) report illustrates the need for a political economic analysis of scholarly publishing. The report examines the current costs of scholarly publishing in the UK and projects these globally, including non-cash costs such as reading and peer review, but excluding research production. Four future scenarios are modeled. The first two, a shift to electronic-only publication for journals and a shift to author side payment for journal articles, reflect an unstated assumption of continuing high profit levels for commercial scholarly publishers. From my perspective, this assumption should be clearly stated, and challenged. The third scenario explores what happens if one aspect of the scholarly communication system, peer review, were to move from the current gift economy to a cash one. It is clear that this would result in an enormous increase in the cost of scholarly publishing. While this scenario is obviously impractical, it is interesting

from a political economic perspective in that it illustrates that a shift from a gift economy to a cash economy can be disastrous, even from a classical economic point of view. Publishers could not raise prices to account for the increased costs of this system, as this would increase the prices far beyond what the market could bear.

Drahos and Braithwaite (2002), whose work is covered briefly in chapter two, locate the present state of academic publishing within a broader context. They see the gradual enclosure of information through intellectual property rights as part of an incomplete project of information feudalism. This enclosure project is based on the idea that private intellectual property rights are necessary to support innovation, an idea that is not supported by evidence. As Drahos and Braithwaite point out, there have been many periods of great creativity, such as the classical music period of the late 18th and early 19th century. This was the age of, among others, Mozart and Beethoven, during which there was no copyright. Drahos and Braithwaite attribute much of the creativity of the past century to investment in public universities, and point out that three of the most consequential contributions of science (the human genome, the Internet, and the secrets of splitting the atom), were so consequential precisely because the U.S. government made them public goods. The current tendency for universities to move from the creation of public knowledge to seeking of patents will likely do more to stifle than encourage innovation.

Drahos and Braithwaite characterize knowledge as an imperfect public good. Traditional economics considers a good to be public when it is non-rivalrous and non-excludable. A good is non-rivalrous when consumption by one person does not diminish the supply for the next person. A good is non-excludable when it is very difficult or

impossible to make the good available for some and not for all. Military security is one example of a nonexcludable good. If a territory is secured, it is secured for everyone in the territory. Knowledge is nonrivalrous in nature; if I know something and someone else learns it, my knowledge is not diminished at all. It is *difficult* to exclude knowledge, but the *texts* that contain knowledge *can* be excluded. Drahos and Braithwaite point out that the nonrivalrous nature of knowledge makes it extremely attractive for capitalists; the same knowledge can be sold, over and over again. As I argue above, it is more accurate to say that enclosing knowledge is extremely attractive for a *few* capitalists, at the expense of the vast majority.

Both Merrett (2006) and Bergstrom (2001) point out the precarious situation of the commercial publisher; all that they own is the journal name. A journal's editorial board, authors, and readers are free to walk away and start their own journal. Until recently, this would have been a difficult decision. Now, however, with the ready availability of free, open source software and the ubiquitous access made possible through open access, plus the widespread availability of new hosting and support services through libraries, what was once difficult is well within the reach of a large and growing percentage of journals.

Striphas (2010) analyzes and critiques scholarly journal publishing in the field of cultural studies. Like other academic areas, cultural studies publishing is heavily dominated by commercial players, including Sage and Taylor & Francis. The journals of these publishers can be up to 8 times more expensive than the journals of not-for-profit publishers such as Duke University Press and Wilfred Laurier University Press. Striphas highlights the contradiction between the participation by cultural studies scholars in this

commercially dominated system that prioritizes profit over communication, and the basic values of cultural studies as articulated by Stuart Hall:

> "Reflecting on the work of Antonio Gramsci, Hall asserts that the first task of the political intellectual is to know more than the other side. He adds that the equally important task is to communicate that knowledge widely and effectively". (Striphas, 2010, 4).

Yet the scholarly communication system cultural studies scholars are caught in prioritizes profit over dissemination. As Striphas points out, commercial publishers have no reason whatsoever to seek to share cultural studies scholarship with labour, environmental, or advocacy organizations if they do not have money to purchase the journals. Striphas recommends that cultural studies scholars take action, by negotiating to retain copyright, participating in open access and refusing to provide peer review for "rogue" journals.

An empirical study of scholarly journals in communication: highlights

This section provides highlights and reflections on an empirical study of scholarly journals in the discipline of communications, summarized in Appendix D. A key finding of this study is that the extent of commercial takeover of journals in the area of communication is less than in other disciplines, particularly STM. There are many scholarly society publishers and small to medium sized independent publishers in this field, as well as over a hundred journals listed in the Directory of Open Access Journals under the subject heading "Media and Communication Studies". Even where journals are published by commercial companies, scholarly societies in some cases are not only still involved, but have retained copyright. For example, the International Communication

Association's (ICA) journals are published by Wiley (formerly Blackwell), but ICA retains the copyright.

Scholarly societies

This retention of copyright by scholarly societies is important and provides a tool for liberation of communication scholarship. Because ICA retains copyright, the association can opt not to renew their contract with Wiley in favour of publishing independently, and take with them the title of their journals and all back issues. One option for alternative publishing arrangements is the emerging library / university presses discussed in chapter two. If any journal's Editorial Board were to canvas members about the possibility of having a local university library or press host the journal, the number of such presses now available means that in most cases several alternative publishing options would be immediately apparent. There is also a growing list of open access publishers; the members of the *Open Access Scholarly Publishers Association* have gone through a vetting process designed to ensure quality publishing.

Scholarly societies themselves are sometimes a part of the problem. Donsbach, speaking on behalf of the International Communication Association (ICA)'s Finance Committee, says: "Publications...yield a surplus of between $500,000 - $600,000 because expenses for the editors' offices stay far below the income". Donsbach expresses concern about open access, as a perceived threat to this revenue (Donsbach, 2008). It should be noted that ICA's surplus is on top of the profits of Wiley, the publisher of the ICA journals. By my estimate, the entire ICA journal publication program could be run as open access, at top quality, for about a quarter of the current ICA surplus, without even factoring in the Wiley surplus, or the current cost of production (Morrison, 2010). This

example, which is not uncommon, illustrates the wide difference between journal pricing and the cost of production.

When scholarly societies outsource publishing services to the for-profit sector, there is an inherent conflict in the goals of the two parties. To return to the ICA example, ICA has outsourced journal production to Wiley, a for-profit corporation with a single overriding goal: profit to shareholders. Continuing to share surpluses with ICA is at conflict with this basic goal of Wiley's. The corporation has incentive to share profits with ICA, only as long as this is the only way to continue publishing the journals. Otherwise, it would be in the interests of Wiley shareholders if ICA were to cease to exist, as this would leave all of the profit for Wiley shareholders. This is not to say that Wiley would deliberately aim to eliminate ICA, rather that the most basic goals of the two parties in this partnership are in fundamental conflict. ICA's desire is to continue to exist and enjoy surpluses from publishing, while Wiley's commitment to shareholders is to maximize profit.

Scholarly societies that have contracted out publishing services do not necessarily retain copyright. For example, the journals of the National Communication Association are published by Informa.plc (Taylor & Francis) "on behalf of the National Communication Association", however it is clear that Informa.plc is retaining copyright. Articles contain a prominent statement to this effect, for example (ironically) on the popular article by Ted Striphas on alienation and scholarly communication, Acknowledged Goods, from *Communication and Critical / Cultural Studies* 7:1, 2010, an article which challenges communication scholars to ask ourselves why we hand over copyright to the for-profit sector. A society in this situation has less clout in negotiating

for liberation of the journal from the commercial publisher, but still does have clout. If the National Communication Association were to drop their contract with Taylor & Francis, this would be a loss to Taylor & Francis as NCA members would be likely to follow NCA to new independent journals as editors, authors, peer reviewers, and readers. One interim step prior to full independence could be to renew the contract with Taylor & Francis, preferably on the shortest term possible, but insist that full copyright for all journal issues, including back issues, be returned to NCA.

Many scholarly society publishers are supportive of the goals of the open access movement, but caught in a situation where the revenue that funds their publications and/or supports their membership revenue is dependent on subscriptions. In this situation, it is helpful to remember that there is no one single approach to open access, but rather a continuum from gratis (free to read) to libre (free to reuse), with many variations. Many journals provide the most open access that they believe that they can without risking necessary revenue for journal production and/or society operations. For example, the *Canadian Journal of Communication* is one example of a journal that provides free access to back issues a year after publication. Journals can also allow, or encourage, authors to make a copy of their own final post-peer-reviewed draft open access through an open access repository.

Open access journals

As discussed in the last chapter, among the new open access entrants to scholarly publishing are predatory open access publishers using highly questionable practices such as spamming potential authors and reviewers, listing people as belonging to their Editorial Boards without asking their permission, and charging article processing fees for publishing services such as coordinating peer review that they may not actually be providing. For this reason, scholars are advised to consult a vetted list of open access journals and/or publishers when considering publishing in an open access journal, particularly one that charges article processing fees.

There are a hundred journals listed under "Media and Communication Studies" under Social Sciences in the Directory of Open Access Journals, a vetted list of fully open access, peer-reviewed scholarly journals. This list includes titles from around the world and in many languages, such as *Comunicación y Sociedad* from Mexico (Spanish), the *RECIIS - Electronic Journal of Communication, Information & Innovation in Health* from Brazil (Portuguese and English), the *Global Media Journal – Turkish Edition*, the *International Journal of Multimedia and Ubiquitous Engineering* from South Korea (English), and the *International Journal of Communication* (IJC) from the United States (English). The latter is just one example of an emerging open access journal backed by a stellar list of communication scholars; the Editorial Board of the *International Journal of Communication* is headed by Manuel Castells and Larry Gross. This bodes well for a rapid rise in prestige for IJS, as does the practice of rapid peer review and publication.

Only 7 of the 100 journals listed as of January 2012 charge article processing fees, a total of 7%. This is a low percentage, however this is not surprising given that

unlike STM, communication scholars are less likely to benefit from multi-million dollar grants that can readily support article processing fees.

Open access monographs are an emerging area of interest and relevance for communication. Options for communication scholars include the publisher members of OAPEN and the *Open Humanities Press*.

Open access archives

Communication scholars can post their works in a number of open access archives; a complete list of vetted archives can be found in OpenDOAR, the Directory of Open Access Repositories. Scholars at many universities will have an institutional repository available. Another option is the interdisciplinary *Social Sciences Research Network*. Communication scholars may also be able to participate in various disciplinary repositories, such as PubMedCentral (for health communication research).

The commercial sector

The commercial sector is involved in publishing a large percentage of communication scholarship, whether directly or in partnership with scholarly societies. Scholars should be learning about the practices of the commercial *owners* or would-be owners of our work, and consider whether these serve the interests of scholarship. The interests of the commercial owners are not necessarily the same as the rhetoric one finds on the website of the owner's "brands". The Taylor and Francis / Routledge website focuses on one type of "results" produced by the company, journals and books. The website of Informa.plc, owner of the Taylor & Francis and Routledge brands, focuses on a different type of results, highlighting the latest share price and providing investors with the Information that matters to them: financial reports detailing profits earned. Any

author, reviewer, or editorial board member working with these companies can choose to leave these companies and start new scholar-led journals or monograph services.

According to the SHERPA RoMEO *Publisher Copyright Policies and Self-Archiving* service, Taylor & Francis' journals in the area of social sciences and humanities allow self-archiving of preprints (before refereeing) with no delay, but have an 18-month embargo on self-archiving of peer-reviewed post-prints. This is a long embargo time. In December 2011(b), Informa.plc announced a new open access program for Taylor & Francis. Details about how this will work have yet to be announced; until the details are known, it is difficult to assess whether the intention is *really* open access or another quasi-open-access hybrid option. Taylor & Francis / Routledge is a major commercial owner of scholarly journals and books in the field of communication.

Sage is another major publisher in the area of communication, a private company whose practices to date seem much more focused on profit than on maximizing the dissemination and usefulness of scholarship, as illustrated in the case of the participatory action research study at the beginning of chapter two.

Another commercial publisher in the communication area that appears to be moving into open access is de Gruyter, with their recent acquisition of open access publisher Versita Publishing (2012), making de Gruyter the third largest open access publisher.

Wiley has become a major publisher in this area, in partnership with scholarly societies, having acquired Blackwell; the potential for emancipation here is the practice of Blackwell of leaving copyright in the hands of its scholarly society partners which has transferred to the Wiley environment.

Elsevier is a relatively small presence in communication publishing, however this company is noteworthy because of its overall size, and its notoriety for anti-open-access lobbying. I wonder if the authors and editorial board of Elsevier's *City, Culture and Society* are aware of Elsevier's lobbying for restrictive copyright practices, as illustrated by their support for the *Research Works Act* which would prohibit the U.S. government from requiring public access to the results of research funded by the American government? [10] If your goals are maximum profits for Elsevier shareholders, then working with Elsevier to publish this journal makes sense. However, if your goal is helping the homeless (a topic of a recent special issue of this journal), then working with this journal is not an optimal way to meet your goals.

Authors who have published works with Elsevier can free their own works through self-archiving their own copy of the final, peer-reviewed manuscript (but not the publisher's PDF) in an open access repository, thanks to Elsevier's green open access policy, as detailed in the Sherpa RoMEO *Publisher Copyright Policies & Self Archiving* service. For older works where the author's own copy is no longer available, it may be worth checking for permission to post the publisher's PDF.[11]

Summary

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[10] This is demonstrated by Michael Eisen (2012), who shows that the defence of this act by U.S. Representative Carolyn Maloney, who has received numerous campaign contributions from senior Elsevier executives, uses the exact wording of an Elsevier employee. If the *Research Works Act* were to succeed, this would mean less access to the medical literature for everyone, even when the research is funded by the public.

[11] For example, I once published an article in a journal owned by Pergamon Press, since taken over by Elsevier. I have not found my copy of the copyright transfer form, and an Elsevier rep has confirmed that they are unable to locate a copy of the form, either, which leaves me free to post the final publisher's PDF of the document in my institutional repository.

Communication scholars have much to contribute to the transformation of scholarly communication from enclosure to an open access knowledge commons. Much has been achieved in the area of liberating our own scholarship, and much more can be done. Communication scholars can publish in and act as reviewers for open access journals, and we can make our own works open access through open access archives. We can encourage our scholarly societies to transition to publication venues that are free to prioritize scholarship over profit. In other chapters I have discussed the importance of collaborative efforts. This might be one suggestion for the field of communication. At present, it is difficult to find a good list of journals in the field; for my empirical analysis, I used a commercial list, EBSCO's *Communication and Mass Media Complete*. I argue that scholars should form our own groups, perhaps including librarians, to track our own scholarship, rather than leaving this to the whims of the commercial marketplace.

Chapter 6: Conclusions

Scholarly knowledge over the past few decades has been undergoing a process of enclosure for the purposes of capitalistic profit. The revenues and profits are enormous, in the billions of dollars annually. This is an inelastic market in which even the financial crisis of 2008 and its impact on universities and scholars, budget cuts and loss of jobs and job security, had absolutely no impact on the bottom line of the for-profit scholarly publishers. This tendency is one portion of an overall push for what has been called a second enclosure movement, of the commons of the mind or Information. This is also part of an overall context of commodification of scholarship and the university. As Mandel pointed out, commodification of scholarly labour tends towards lowering its cost to that of its reproduction.

A major counter-trend is the movement for open access to the scholarly literature. Building on the gift-based traditions of scholarship, through which scholars give away their scholarly journal articles and peer review services, open access makes it possible for anyone, anywhere with an internet connection to access a scholarly work. My vision is of a global knowledge commons, in which all of the collective knowledge of humankind is freely available to everyone, and all are welcome to contribute. One of the original contributions of this thesis is an in-depth analysis of the overlap of open access and the Creative Commons licensing. This analysis reveals a weakness in the CC Attribution only license, which superficially appears to express the intent of libre open access, but creates vulnerabilities to re-enclosure of CC-BY licensed works, may inhibit development of sustainable open access initiatives by requiring allowance for commercial works, and allows for derivatives that do not advance the vision of what open access is

for, for example putting those who make their work open access in a position where they may not be able to benefit from derivatives based on their works. My perspective, argued in detail in chapter 3, is that the strongest CC license for open access is CC Attribution-Noncommercial-Sharealike as it requires open access downstream, and prevents commercial capture of open access works, recognizing that the CC Version 3.0 definition of noncommercial is problematic.

One of the contributions of this thesis is pointing to a need for systemic analysis to overcome a problem of irrational rationality, or as Weber would have expressed it, formal rationality combined with substantive irrationality. The actions of individuals and organizations that are perfectly rational when assessed at an individual level – the single goal of profit for the corporation, the budget cuts to university presses by universities struggling to manage in challenging financial circumstances, the gifting by authors of their life's work to for-profit companies whose interests conflict with those of the authors, in order to secure tenure and promotion – add up to a system that makes no sense, university tenure and promotion committees demanding that scholars produce more monographs than makes sense from the perspective of good writing and sharing of knowledge, while at the same time cutting the budgets of the university presses that traditionally published these monographs.

This thesis provides three examples of this kind of systemic analysis in practice, the *Dramatic Growth of Open Access* series, a macroeconomic look at support for scholarly communication, and a discipline-wide perspective of scholarly communication in the field of communication. The *Dramatic Growth of Open Access* series is a combination research and advocacy tool, providing evidence of the extent and growth of

the open access movement in several of its various flavours. This series has been instrumental in countering both deliberate and accidental misperceptions that open access is less successful than is in fact the case. For example, when OA advocates encounter an occasional journal that turns from open access to subscriptions, this can be discouraging, so it is important to be aware that the net growth rate of the *Directory of Open Access Journals* is 4 titles per day.

The chapter on economics provides evidence of the potential for transition of the whole of scholarly publishing to an open access system, with the current budgets of academic libraries being seen as the major source of support for scholarly publishing and a key to the transition being a shift of this economic support from demand / purchase to supply / production. This chapter shows that this transition is affordable *without the high profits of scholarly publishers*. A focus on efficiencies in the transition process, with average cost per article being a central metric, is recommended. A scholar-led publishing system using Open Journal Systems has been found to function with under $200 per article on average; if all of scholarly journal publishing was part of this system, the cost savings for academic libraries would be 96% of current spend. Current open access publishers using the article processing fee approach, including Hindawi and PLoS, have article processing fees that, if they were the average in an open access environment, would result in substantial cost savings for academic libraries. On the other hand, shifting to production-side economics assuming current revenue for scholarly publishers or per-article costs far above the necessary costs for production, could increase costs over the current system and transfer an unfair share of the burden to the largest research libraries.

Communication as a discipline is in better shape to transition to open access than many other disciplines, particularly those in science, technology and medicine (STM). Communication publishing has a healthy percentage of scholarly society publishers, over a hundred fully open access journals, and less concentration in the hands of the large for-profit commercial publishers than other fields. Communication scholars have much to offer the field of transitioning scholarly communication, in particular political economic analysis and arguments against the enclosure of knowledge.

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Appendix A: Open access journals by region and country

This appendix provides detailed breakdown of journals listed in the Directory of Open Access Journals by region and country, illustrating the global reach of the open access movement. As of January 2012, DOAJ lists more than 7,000 fully open access, scholarly peer-reviewed journals, published in 117 countries.

Open access journals by region

The following tables group open access journals by region, based on Wikipedia. The rank is the overall rank for all journals. A table listing all journals by rank follows.

Europe

Rank	Country	# journals
3	United Kingdom	529
4	Spain	401
6	Germany	241
8	Romania	218
9	Italy	196
10	Turkey	182
12	France	138
14	Poland	131
21	Switzerland	103
24	Croatia	82
26	Serbia	78
27	Portugal	57
29	Czech Republic	54
30	Netherlands	51
31	Sweden	51
33	Russia	42
37	Austria	38
38	Greece	37
39	Slovenia	33
41	Bulgaria	31
42	Denmark	31
44	Ukraine	29
45	Norway	27
46	Slovakia	26
47	Lithuania	25
50	Belgium	23
52	Estonia	21

Rank	Country	# journals
53	Hungary	20
58	Bosnia	13
62	Ireland	9
65	Macedonia	8
77	Cyprus	4
81	Armenia	3
82	Georgia	3
83	Iceland	3
84	Kosova	3
90	Malta	2
91	Moldova	2
95	Latvia	2
101	Belarus	1
110	Luxembourg	1
Europe total		**2949**

North America

Rank	Country	# journals
1	United States	1345
7	Canada	226
19	Mexico	109
North America Total		**1680**

South America

Rank	Country	# journals
2	Brazil	664
11	Colombia	148
16	Chile	127
18	Argentina	112
25	Venezuela	78
35	Finland	38
54	Peru	20
75	Uruguay	4
85	Bolivia	3
89	Ecuador	2
109	Paraguay	1
South America Total		**1197**

Asia

Rank	Country	# journals
5	India	377
15	Iran	127
20	Japan	104
23	Pakistan	89
28	Malaysia	55
36	South Korea	38
40	China	32
43	Indonesia	29
51	Hong Kong	22
55	Bangladesh	20
56	Taiwan	16
57	Philippines	14
59	Israel	13
60	Thailand	12
63	Nepal	9
66	United Arab	8
67	Jordan	8
69	Singapore	7
70	Sri Lanka	7
71	Azerbaijan	6
72	Saudi Arabia	6
87	Iraq	2
99	Oman	1
100	Bhutan	1
102	Vietnam	1
103	Brunei	1
105	Lebanon	1
112	Kuwait	1
113	Qatar	1
115	Yemen	1
116	Bahrain	1
117	Kyrgyzstan	1
Asia total		**1011**

Africa

Rank	Country	# journals
13	Egypt	133
32	South Africa	43
49	Nigeria	23
64	Tunisia	9
68	Kenya	7

Rank	Country	# journals
73	Morocco	5
74	Ethiopia	5
76	Uganda	4
80	Tanzania	3
88	Libya	2
92	Ghana	2
93	Mauritius	2
96	Madagascar	1
97	Algeria	1
106	Jamaica	1
107	Senegal	1
108	Cote d'Ivoire	1
114	Sierra Leone	1
Africa total		**244**

Australasia

Rank	Country	# journals
17	Australia	121
22	New Zealand	95
Australasia total		**216**

Caribbean

Rank	Country	# journals
34	Cuba	41
78	Bahamas	3
94	British Virgin	2
98	Dominican	1
104	Barbados	1
111	Martinique	1
Caribbean total		**49**

Central America

Rank	Country	# journals
48	Costa Rica	24
61	Puerto Rico	10
79	Guatemala	3
86	Nicaragua	2
Central America Total		**39**

Open access journals by country

The following table shows all countries listed in DOAJ country statistics ranked by number of journals.

Rank	Country	# journals
1	United States	1345
2	Brazil	664
3	United Kingdom	529
4	Spain	401
5	India	377
6	Germany	241
7	Canada	226
8	Romania	218
9	Italy	196
10	Turkey	182
11	Colombia	148
12	France	138
13	Egypt	133
14	Poland	131
15	Iran	127
16	Chile	127
17	Australia	121
18	Argentina	112
19	Mexico	109
20	Japan	104
21	Switzerland	103
22	New Zealand	95
23	Pakistan	89
24	Croatia	82
25	Venezuela	78
26	Serbia	78
27	Portugal	57
28	Malaysia	55
29	Czech Republic	54
30	Netherlands	51
31	Sweden	51
32	South Africa	43
33	Russia	42
34	Cuba	41
35	Finland	38
36	South Korea	38
37	Austria	38
38	Greece	37
39	Slovenia	33

Rank	Country	# journals
40	China	32
41	Bulgaria	31
42	Denmark	31
43	Indonesia	29
44	Ukraine	29
45	Norway	27
46	Slovakia	26
47	Lithuania	25
48	Costa Rica	24
49	Nigeria	23
50	Belgium	23
51	Hong Kong	22
52	Estonia	21
53	Hungary	20
54	Peru	20
55	Bangladesh	20
56	Taiwan	16
57	Philippines	14
58	Bosnia	13
59	Israel	13
60	Thailand	12
61	Puerto Rico	10
62	Ireland	9
63	Nepal	9
64	Tunisia	9
65	Macedonia	8
66	United Arab	8
67	Jordan	8
68	Kenya	7
69	Singapore	7
70	Sri Lanka	7
71	Azerbaijan	6
72	Saudi Arabia	6
73	Morocco	5
74	Ethiopia	5
75	Uruguay	4
76	Uganda	4
77	Cyprus	4
78	Bahamas	3
79	Guatemala	3
80	Tanzania	3
81	Armenia	3
82	Georgia	3
83	Iceland	3

Rank	Country	# journals
84	Kosova	3
85	Bolivia	3
86	Nicaragua	2
87	Iraq	2
88	Libya	2
89	Ecuador	2
90	Malta	2
91	Moldova	2
92	Ghana	2
93	Mauritius	2
94	British Virgin	2
95	Latvia	2
96	Madagascar	1
97	Algeria	1
98	Dominican	1
99	Oman	1
100	Bhutan	1
101	Belarus	1
102	Vietnam	1
103	Brunei	1
104	Barbados	1
105	Lebanon	1
106	Jamaica	1
107	Senegal	1
108	Cote d'Ivoire	1
109	Paraguay	1
110	Luxembourg	1
111	Martinique	1
112	Kuwait	1
113	Qatar	1
114	Sierra Leone	1
115	Yemen	1
116	Bahrain	1
117	Kyrgyzstan	1
Total		**7385**

Source: *DOAJ Country Statistics*. Retrieved January 10, 2012 from

http://www.doaj.org/doaj?func=byCountry&uiLanguage=en

Appendix B: The Dramatic Growth of Open Access: Rationale & Method

The *Dramatic Growth of Open Access* (DGOA) is a quarterly series designed to capture at a macro level the best indications of growth of open access scholarly literature and related metrics (such as open access mandate policies). This *Rationale & Method* is designed for readers of DGOA. DGOA is available in open data editions (see the DGOA dataverse http://dvn.iq.harvard.edu/dvn/dv/dgoa). Summaries and commentary are posted on my scholarly blog, The Imaginary Journal of Poetic Economics, at: http://poeticeconomics.blogspot.com/2006/08/dramatic-growth-of-open-access-series.html

About the researcher

My approach to research holds that it is important for the reader to be aware of the perspective of the researcher, and so I disclose at the outset that I am an open access advocate, and that this Informal research project, in which I aim for the greatest accuracy possible, forms a part of my OA advocacy. I am a PhD candidate at the SFU School of Communication, where my research will focus on scholarly communication and open access. My work on the *Dramatic Growth of Open Access* began long before I thought of applying for the PhD program.

Rationale: seeing the forest and the opportunities

The need for a macro level approach to assessing the growth of open access is apparent from my perspective, for three major reasons. First, the strong growth of open access is important to understand because of its implications for the work of scholars and those who work with scholars, including librarians and publishers. The strong growth of DOAJ came as a pleasant shock to me about 2004, when I compared the number of titles

in the DOAJ with the number of DOAJ titles in our local journal knowledgebase, CUFTS, and found that we were behind by several hundred titles in a short period of time. Even though I am a *very* optimistic open access advocate (from my perspective, OA is not only necessary, it is inevitable), I am constantly amazed at the breadth and depth of the OA movement and the growth in open access materials; this is why the series is named "Dramatic Growth". It is about this time that I wrote the first iteration of this series, a peer-reviewed article for the Journal of Interlibrary Loan, Document Delivery & Electronic Reserve, designed to alert my librarian colleagues to the extent of the material already available, and the implications and opportunities this presented for our work (Morrison, 2006).

Second, the macro view of constant growth is important to counter misperceptions about open access growth. For the institutional repository manager with an IR that is indeed growing slowly, or not at all, it is very easy to miss the big picture, which now includes a global IR movement that it growing by the millions of items every quarter. When we focus on the details, it is easy to see the occasional OA setback (as when one title reverts from open access to toll access) as a sign of failure, when the macro level view at that very moment is that the world likely saw a net increase of open access journals, even on the very day that the setback occurred; the Directory of Open Access Journals (DOAJ) is adding an average of 4 titles per day; this is a net gain, after the DOAJ weeds all of the one-off setbacks for that year.

Finally, I *am* and always have been an optimistic open access advocate. Even when I first began this series in 2005, I foresaw that it would yield beautiful charts to illustrate the growth of OA, and indeed for several years now the data has been useful to

create such charts to illustrate the dramatic growth of open access. Impressive though growth to date is, it is still the case that most of the world's scholarly literature remains behind toll barriers. From my perspective, what this means is that there will be a need for this series for years to come. Others may see this not as dramatic growth, but rather as painfully slow growth of open access. Fair enough; the facts are as they are (elusive to capture though they may be), but when it comes to perspectives, there is no one viewpoint that is correct, and our world is richer when there are more ways of seeing things, rather than less.

Data collection

Most data is captured from the website of the initiative in question on the date of the issue of the DGOA in question. Data has also been provided by Peter Suber and Tim Gray (of Homerton College Library). PubMedCentral article data is captured using the search which can be found on the PMC free tab of the DGOA spreadsheet. Older data has been gathered from the Internet Archive's *The Wayback Machine*.

Open access journals

The *Directory of Open Access Journals* (DOAJ) http://www.doaj.org has been selected as the best available surrogate for the total number of fully open access, peer-reviewed scholarly journals in the world. The DOAJ is a vetted list of fully open access, active, peer-reviewed journals. The DOAJ list is an imperfect measure of OA journals, as the vetting process tends to result in delay of inclusion of new titles, and the comprehensiveness of discovery of new titles is unknown. For example, it is not clear to me whether all Chinese open access journals (particularly those in Chinese languages) have been reported to DOAJ. The DOAJ title count does not include hybrid journals

(although DOAJ *search* services do include hybrids), with some articles open access and others toll access, or journals that provide free back access. In summary, the DOAJ title count is used as a surrogate for the total number of open access journals, although DOAJ understates this number to an unknown extent.

The *Highwire Free* http://highwire.stanford.edu/lists/freeart.dtl collection and the *Electronic Journals Library* http://rzblx1.uni-regensburg.de/ezeit/index.phtml?bibid=AAAAA&colors=7&lang=en are more inclusive lists, that include journals with free back issues as well as fully open access journals. The *Electronic Journals Library* includes journals of interest academically that are not necessarily peer reviewed. Important as peer review is in an academic context, there have always been non-peer-reviewed sources included in academic libraries for good reason (consider magazines such as *Wired* or *Adbusters*, for example), and it is important to be aware that while peer review and open access are most compatible, the universe of quality free material is much larger than the OA peer review literature reflected in DOAJ.

Open J-Gate http://www.openj-gate.com/Search/QuickSearch.aspx is a search service for English-language open access journals, including both peer-reviewed and non-peer-reviewed journals, with separate title counts made available for peer-reviewed titles and total titles.

The PubMedCentral http://www.ncbi.nlm.nih.gov/pmc/ title list count is included as an interesting (to me) case study. While the NIH *Public Access Policy* http://publicaccess.nih.gov/ applies only to authors of NIH-funded authors, not journals at all, the number of journals voluntarily participating in PMC continues to grow.

Open Journal Systems http://pkp.sfu.ca/?q=ojs is included because this free, open source software is in use by more than 9,000 journals around the world, about half of which are fully open access. Including OJS in this series is a way of recognizing that this software has been instrumental in the dramatic growth of open access. Data is gathered by hand by Public Knowledge Project staff and/or research associates, and may be understated; as OJS is open source software, those using OJS have no obligation to report.

Open access archives (repositories) and articles

OpenDOAR http://www.opendoar.org/, as a vetted list of open access archives (repositories), is a standard for the number of archives (repositories). The Registry of Open Access Repositories (ROAR) http://roar.eprints.org/ is included since I began tracking this earlier, and it remains useful for comparison purposes. Both services provide access to a great deal of growth data and charts for repositories.

As a surrogate for the number of open access articles, I currently use the Bielefeld Academic Search Engine (BASE) http://base.ub.uni-bielefeld.de/en/index.php, and I have used Scientific Commons http://en.scientificcommons.org/ in the past, and may do so again in the future (Scientific Commons' numbers are not being updated at the moment). Limitations of these services for this purpose are that the archives (repositories) searched include items with metadata only, lacking fulltext; also, these archives contain a variety of materials, ranging from scholarly articles and theses to data to material that is less scholarly in nature; and the extent of overlap (duplication, for example if multiple authors each submit to their local repository) is unknown. In spite of these limitations, the sheer numbers, both in size (well over 28 million items) and growth (millions per quarter), are

a strong indication that collectively these repositories are full of *stuff*, even if it isn't absolutely clear what that stuff *is*.

Elusive as the total number of open access or freely available articles is, there are a number of indicators of strong growth in open access articles. In December 2010, I included Mendeley, as this is a popular service that appears to be growing quickly. Mendeley is an interesting service to study; while institutional repository managers gripe about the difficulty of recruiting content, researchers are flocking to services like Mendeley and voluntarily uploaded articles by the droves.

Several archives are tracked separately, illustrating the growth in open access articles available through OA archives. The total number for PubMedCentral (close to 2 million as of December 2010) is taken from ROAR, even though this number is an underestimate, for comparison purposes. PMC data is tracked in depth (see the third tab on the spreadsheet), in total and by NIH funding (for external and internal researchers and in total), and by time. This provides a very rough estimate of the success of the NIH Public Access policy, from a public view-point. In December 2010, I began to add some preliminary data for CIHR and Wellcome Trust, as small indicators of the value to all of expanding PMC internationally, as well as total OA articles in PMC. arXiv http://arxiv.org/ and RePEc http://www.repec.org/ both represent relatively well-established, mature archives; E-LIS http://eprints.rclis.org/ is included as the major archive for LIS.

Open access policy

Data are taken from the *Registry of Open Access Material Archiving Policies* (ROARMAP) http://www.eprints.org/openaccess/policysignup/. ROARMAP relies on

self-reporting, and so policy numbers may be understated; this is probably the case with theses open access mandate policies.

Open data

Open data (to scholarly research data, government data) is closely related to the open access movement, and also appears to be growing rapidly. The number of journal open data policies in the Open Access Directory is included as of December 2010. Other macro level metrics for open data is one area for possible future exploration.

Baseline growth of scholarly journals and articles

As reported by Ware (2006, p. 3), citing Mabe (2001), there are about 23,000 scholarly journals in the world, collectively publishing1.4 million articles a year. The number of articles published each year and the number of journals have both grown steadily for over two centuries, by about 3% and 3.5% per year respectively. The reason is the equally persistent growth in the number of researchers, which has also grown at about 3% per year and now stands at around 5.5 million.

Data, commentary and review

Data is provided for downloading from the *Dramatic Growth of Open Access Dataverse* http://dvn.iq.harvard.edu/dvn/dv/dgoa (courtesy of Harvard), and previous issues were posted to Google docs for easy viewing. Each issue includes a full data edition and a show growth edition (generally illustrating growth over the previous quarter and year).

The spreadsheet for the full data edition includes 8 sub-sheets (tabs):

- DGOA (Dramatic Growth of Open Access)
- DGOA Notes (detailed notes to accompany DGOA)

- PMC Free (PubMedCentral free)
- Wayback Machine Data
- PMC Individual Journals (occasional analysis of articles in selected biomedical journals)
- PMC Individual Notes (accompanies PMC Individual Journals; also instructions for subscription-based publishers wishing to evaluate their authors' compliance with NIH policy)
- Journal Collection Comparison: occasional comparison of large journal collections (e.g. DOAJ, Highwire Free, Science Direct)
- Article metasearch comparison (occasional comparison of large article search tools, e.g. Scientific Commons, Science Direct)

Commentary is posted to my blog, *The Imaginary Journal of Poetic Economics*; links to all issues of the series, and occasional between-series notes, is available here: http://poeticeconomics.blogspot.com/2006/08/dramatic-growth-of-open-access-series.html

The Dramatic Growth of Open Access series is not peer-reviewed in a traditional sense, except for the original article for Journal of Interlibrary Loan, Document Delivery & Electronic Reserve. However, this series is well read by many, including experts in the area of open access, who occasionally provide comments, corrections, and suggestions. Not peer review, but perhaps review by peers? This is of interest to me, as someone who sees scholarly communication as in a time of transformation. While I see traditional peer review and other forms of academic quality control as vital and not to be dismissed until better alternatives are found, I would suggest that the Informal research project that is

The Dramatic Growth of Open Access is more valuable as an ongoing quarterly series than it would be if I had stopped with the one peer reviewed article. Peer review is indeed necessary and desirable, but if we relied solely on peer review, would we be basing our knowledge on data that is largely out of date in this rapidly changing area?

Final note

This is the fourth version of the rationale and method for The Dramatic Growth of Open Access (the first issue was Dec. 31, 2010, the second March 31, 2011, and the third June 30, 2012).

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Appendix C: how many active, scholarly peer reviewed journals?

This is an exercise designed to calculate the number of active, scholarly peer reviewed journals as listed in Urlich's on December 1, 2011, and to estimate the total number of academic periodicals of all types, as these may be reflected in revenue estimates of scholarly publishers. Calculations are based on Ulrich's Advanced Searches with the search terms listed, and a process to deduplicate titles (e.g. a journal with a print and an online version is listed twice), by adding together the number of print titles and electronic-only.

Questions and answers

1. How may active, academic / scholarly, peer reviewed journals?

   26,746 (estimated). Based on Ulrich's search for active, academic / scholarly, peer reviewed journals (total 53,097), deduplicated by adding up entried for print journals (under format = 23,442) and electronic-only 3,304

2. How many active, academic / scholarly periodicals (journals or other types)?

   47,845. Calculations from the following table:

Ulrich's search terms	#
active, academic / scholarly, peer-reviewed journals	26,746
Academic / scholarly, not journal	
active, academic / scholarly magazine	994
active, academic / scholarly monograph series	18,152
active, academic / scholarly proceedings	1,146
active, academic / scholarly newsletter	807
Total academic / scholarly, not journal	21,099
Total active, academic / scholarly periodicals (journals and non-journals)	47,845

Appendix D: Communication as a discipline and scholarly journal publishing

This Appendix reports on the results of an empirical study of scholarly journals in communication, originally part of this article:

Morrison, H. (2011). Enclosure and emancipation in scholarly journals publishing: Overview, critical, global and communication perspectives. *Stream* 4:1. Retrieved January 15, 2012 from http://www.streamjournal.org/index.php/stream/article/view/56

One problem confronting the communication scholar is the difficulty of defining the discipline, as noted by International Communication Association (ICA) Presidents Rice and Putnam (2007) and Poor (2009). Ulrich's *Periodicals Directory* is generally considered the world's most authoritative list of scholarly journals. However, under the subject heading "Communications", there are many journals listed that are actually in technology areas relating to communication, more suitable to engineers than to critical communication scholars. Some communication journals are not listed under the subject "Communications", for example the *Canadian Journal of Communication*, which is assigned the subject heading of sociology.

For analysis, I selected the periodical list from EBSCO's *Communication and Mass Media Complete*, and the Directory of Open Access Journals, for the time frame of 2010. While the EBSCO list is clearly problematic[12], it is the most comprehensive and

[12] The EBSCO *Communication and Mass Media Complete* list is clearly problematic for research on communication journal publishing. One problem is related to the scope of the database, e.g. including journals with only partial content in this area. For example, 79 journals are listed in this database as published by Sage publications, while the Sage *Media and Communication* title list includes only 39 journals. Another problem is accuracy; for example, journals of the International Communication Association are listed as published by the National Communication Association. In spite of the problems,

reasonably focused list available. Of the 642 titles in the EBSCO list, half (323) are listed as published by publishers with 10 or more titles in this field. All of these journals have some commercial involvement, although many are published by scholarly societies in partnership with companies. Informa is *not* included on EBSCO's list, even though it is the owner of Taylor & Francis, Routledge, and Psychology Press. With 70 journal titles, Informa is the largest publisher in communication. Informa.plc is a sizable transnational corporation, with 150 offices in 40 countries, and Informa describes itself as the world's leading organizer of conferences and courses, in addition to academic publishing. 2009 revenue was £1,221.7m and adjusted operating profit £309.5m, for an adjusted operating margin of 25.3%, up from 2008's 23.9%, according to the Informa Annual Report (2009), which paints a rosy picture for the future with "the majority of subscriptions…renewing in line with previous high rates" (Highlights, Summary and Outlook). According to Chief Executive Peter Rigby, the publishing business is doing exceptionally well, accounting for 72% of the profits (£222m).

Curiously, while Informa may be the world's largest journal publisher in the area of communication, it is very difficult to find a usable list of communication journals from the Informa website. To find the list of 70 journals, I went to the Routledge page and

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this appears to be the most comprehensive list in this area, including 642 titles, and appears to be sufficient for a broad overview of ownership in this area. To analyze the journals listed in EBSCO's Communication and Mass Media Complete database, I downloaded the title list, and limited to academic journals identified as peer-reviewed.

If the EBSCO list is somewhat imperfect, this may reflect to some extent the dizzying speed of recent concentration in this area. EBSCO lists 10 journals published by the independent business Multimedia Matters. According to the Multimedia Matters website (2010), their journals are owned by Taylor & Francis and published under the Routledge imprint, as of April 2008. The EBSCO list includes 27 titles under Blackwell, now owned by Wiley.

clicked on "special offers". Elsevier, the world's largest scholarly publisher and a highly profitable transnational corporation, publishes 19 titles in this area, including 8 titles under the Pergamon Press imprint, according to EBSCO's Communication and Mass Media Complete. Communication is not listed as a subject heading, or even as a sub-heading under Social Sciences on the Elsevier website. Similarly, Springer, the world's second-largest scholarly publisher and another transnational corporation, publishes 16 titles in this area according to the EBSCO list, but does not list communication as a discipline or sub-discipline on the Springer website. There may be Elsevier or Springer communication journal lists elsewhere that I have not found, however it is clear that these publishers are not proudly highlighting their holdings in communication journals. Why is this so? I have no way of knowing for sure, so this is pure speculation, but I wonder whether the priorities of these publishers is the highly profitable science, technology, and medicine (STM) sector, and they simply haven't bothered with developing marketing lists for the less profitable area of communication. This would be worthy of further exploration; one wonders how other areas in the social sciences and humanities fare on the websites of these publishers.

Wiley-Blackwell (2010), the last major transnational corporation on this list, includes 18 titles under *Communication & Cultural Studies* on the Wiley Interscience website. Altogether, this makes approximately 123 of the 642 journals in the field of communication, or about 20%, that are owned by transnational corporations[13]. This ownership situation is more complex than it at first appears. There are many journals that

[13] The reason this is approximate is because I am not able to verify the Elsevier or Springer title counts, and as mentioned above, the 642 titles may reflect a broader scope than just communication.

are published by corporations that are actually published in partnership with learned societies. Of the 18 Wiley Blackwell titles, scholarly societies hold the copyright to 11 titles, including, for example, the 5 International Communication Association Journals. The National Communication Association (2010) sponsors 10 journals, which are published by Routledge (owned by Informa). Even where the corporation "owns" the copyright to the journal, as mentioned above they do not own the academic editorial board. While they may have ownership to *previous* issues, they do not have ownership of *future* issues, an important point, as it is recent Information that is lucrative in this business.

There are still several significant independent publishers in this area, including the John Benjamins Publishing Company with 39 titles, Lawrence Erlbaum Associates with 32 titles, De Gruyter with 20 titles, and Intellect Ltd. with 13 titles (according to the EBSCO list). Sage, an independent company, publishes 37 journals in *Media and Communication Studies*, plus Communication Abstracts. According to the Sage website, Sage publishes a total of over 560 journals, of which 245 (43%) are on behalf of learned societies and institutions.

Scholarly society journals and those published by independent presses are doing very well by the standard of the traditional impact factor. It should be noted that the impact factor is problematic for many reasons, and in my opinion is overused as an estimate of journal quality. However, it may be noteworthy that the corporate sector, despite the huge profits, does not necessarily fare as well by this traditional indicator of quality as one might think. Of the top 10 journals in communication by impact factor, only one, Taylor & Francis' *Journal of Health Communication*, is fully owned by a

transnational corporation. The 4 journals of the International Communication Association (published by Wiley on behalf of the association) are in the top 10. The not-for-profit Oxford publishes one title, and the remaining 3 titles are published by independent companies Sage, John Benjamins, and Mary Anne Liebert. A list of titles, publishers, and impact factor can be found in Appendix E. These findings are similar to those of Bergstrom (2001) in the area of economics. Like economics, highly profitable commercial publishers are not well represented at the top of the impact factor list. However, economics and communication are clearly different in the number of scholarly society titles outsourced to commercial publishers, and more independent commercial publishers appear high on the impact factor list in communication.

The other half of the EBSCO *Communication and Mass Media Complete* title list is composed of publishers with fewer than 10 titles in this area, 299 journals altogether. Most of these are very small publishers, with 1-3 titles each. The vast majority of these journals are in the not-for-profit sector, published by scholarly societies or associations or university presses. For example, Cambridge University Press publishes 9 titles; Oxford, 6, and the California University Press, 5. A fairly typical example is the Canadian Communication Association that publishes only one journal, the *Canadian Journal of Communication*.

Striphas (2010) analyzes a selection of journals in the area of cultural studies, and finds that the rate of increase of journal titles between 1960 and 2004 was an average 6.3 percent per year, double the overall rate of increase for all journals in this time frame. One possible explanation for this extra growth is growth in the area of cultural studies per se during the last half century.

To summarize this section, journal publishing in communication shows more diversity in ownership and less concentrated ownership by large transnational corporations than is the case in scholarly publishing overall. Even among the estimated 20% of communication journals owned by transnational corporations, there are many journals where scholarly societies still own the title. There are still independent publishers, and many not-for-profit publishers active in this area; it is these publishers who dominate the top of the traditional impact factor list. This is good news, in that it suggests a stronger than average potential for emancipation. That is, the large, highly profitable transnational corporate publishers do not have a stranglehold on communication publishing, as they do in other disciplines.

There is a large and growing body of fully open access journals in the field of communication. The Directory of Open Access Journals listed 76 titles under the subject heading of *Media and Communication* at the time of data analysis (the total is 100 titles as of 2012). Given the difficulty of assessing the total number of journals in communication per se, and a lack of research on the relative percentages of OA journals across disciplines, it is difficult to estimate the percentage of OA journals in communication in comparison with other disciplines. This is an area where further research would be helpful. There is some overlap between DOAJ and the EBSCO list. The vast majority of the OA journals, more than 80%, are published by the not-for-profit sector. Two-thirds, or 50 journals, are published by universities; about 15% are published by societies (11 journals); and 1 by a library. One is published by an independent publisher, and two by the for-profit corporation Hindawi publishing. The 76 journals have 74 different publishers; aside from Hindawi, the only publisher on the list with 2

journals is Queensland University.

These journals are published in 25 different countries on 5 continents (Africa is not represented, and there is only 1 journal published in Asia), and 12 languages are represented (a western-centric list of languages, with only one journal in Chinese). This list reflects a greater cultural diversity than the EBSCO Communication and Mass Media Complete, but is still lacking in non-western representation. The journals in the DOAJ Media and Communication list are mostly very new journals, based on the start date in DOAJ[14]. There are 2 journals with start dates in the 1980s, 11 in the 1990s, and the remaining 61 have start dates in the 2000s. Note that the DOAJ start date is not necessarily the year of the founding of the journal, as older journals often have back issues that have not yet been digitized and placed online.

Poor (2009) conducted a citation study comparing citations of a sample of 17 open access journals in communication studies with the overall citation patterns for the field. Similar citation patterns were found, albeit with more international citations for the open access journals. Poor concludes that this is an indication of the health of the open access journals and of the field as a whole. That is, open access is very much a part of the overall conversation in the field, not a side-conversation as would be indicated by significantly different citation patterns.

Further emancipation and sites of struggle

By "emancipation", what I mean is scholarship that is as free as possible for readers, one that is designed to serve the needs of scholarly communication led by

[14] The DOAJ start date is not necessarily the journal start date, as older journals may not have all back issues freely available. The DOAJ start date reflects the first date for which free fulltext is available.

scholars themselves, and is free to prioritize advancement of knowledge rather than serve the interests of capital, as exemplified by the profit motives of commercial publishers. This is a large project, and one that this article only begins to address.

As noted above, the active involvement of scholarly societies and the limited control by the corporate sector bodes well for emancipation in the discipline of communication. However, all scholarly publishing is impacted by the control the commercial sector has over scholarly publishing overall. Library budgets are tied up in the "big deals" of the large commercial publisher, which limits the availability of funds for new open access initiatives.

Scholarly societies themselves are sometimes a part of the problem. Donsbach, speaking on behalf of the International Communication Association (ICA)'s Finance Committee, says: "Publications...yield a surplus of between $500,000 - $600,000 because expenses for the editors' offices stay far below the income". Donsbach expresses concern about open access, as a perceived threat to this revenue (Donsbach, 2008). It should be noted that ICA's surplus is on top of the profits of Wiley, the publisher of the ICA journals. By my estimate, the entire ICA journal publication program could be run as open access, at top quality, for about a quarter of the current ICA surplus, without even factoring in the Wiley surplus, or the current cost of production (Morrison, 2010). This example, which is not uncommon, illustrates the wide difference between journal pricing and the cost of production today.

One of the ICA journals, the *Journal of Computer Mediated Communication*, is open access, even though it is hosted on the Wiley server. This suggests that there is struggle within the ICA over such issues. ICA's reliance on a surplus from publishing

profits is a very common experience for scholarly societies, and one of the barriers to change. In addition to concern about loss of publishing surpluses, societies worry that they will lose members without the member benefit of free or discounted access to journals. Threats to societies from loss of revenue and exclusive membership benefits to journals are not new. For most societies, the increasing share of library budgets going to commercial publishers has meant that there is less available for their journals. Library site wide subscriptions to journals in electronic form have been decreasing the value of journals as an exclusive member benefit for years. Societies with organizational models based on a world where Information was disseminated in print need to rethink how their organization will work in the future. For the vast majority of scholarly societies (including ICA), a model that limits dissemination of scholarship is at odds with the basic mission of the society, which usually includes statements about disseminating knowledge as broadly as possible.

When scholarly societies outsource publishing services to the for-profit sector, there is an inherent conflict in the goals of the two parties. To return to the ICA example, ICA has outsourced journal production to Wiley, a for-profit corporation with a single overriding goal: profit to shareholders. Continuing to share surpluses with ICA is at conflict with this basic goal of Wiley's. The corporation has incentive to share profits with ICA, only as long as this is the only way to continue publishing the journals. Otherwise, it would be in the interests of Wiley shareholders if ICA were to cease to exist, as this would leave all of the profit for Wiley shareholders. This is not to say that Wiley would deliberately aim to eliminate ICA, rather that the most basic goals of the two parties in this partnership are in fundamental conflict. ICA's desire is to continue to

exist and enjoy surpluses from publishing, while Wiley's commitment to shareholders is to maximize profit.

The Canadian Journal of Communication (Felczak, Smith & Lorimer, 2008) participates in the Public Knowledge Project (2010), discussed earlier, contributing to the development of the free, open source Open Journals Systems software. The journal also participates in the Canada-wide Synergies (2010) project that assists Canada's social sciences and humanities journals to publish in an online environment. The authors argue that Synergies and Open Journal Systems present academics with "strategic opportunities to define and control online scholarly publishing". The Canadian Journal of Communication, like many journals, follows a partially open access model, with new issues limited to subscribers for an embargo period of one year, followed by open access to everyone.

Scholars can aim to publish in open access journals where possible, within the context of current tenure and promotion expectations. Furthermore, scholars can choose to serve on the editorial boards of open access journals, and refuse to provide free peer review services for the highly profitable commercial sector. Senior scholars and university administration can assess whether tenure and promotion guidelines should be updated to reflect the need for change in scholarly communication. Most open access journals do not charge publication fees. However, when they do, the library may have a fund to cover such fees, and research grants may often be used for this purpose.

Another site of resistance is self-archiving of published articles for free access. The majority of traditional publishers allow author self-archiving, as documented by the Sherpa RoMEO Publisher Copyright Policies and Self-Archiving site. For example, Sage

journals permit self-archiving of preprints, and post-refereed postprints (after a 12 month embargo). Scholars can negotiate rights retention through the use of an author's addendum, such as the *SPARC Canadian Author's Addendum* (SPARC, 2010).

Finally, funding agencies, universities, and research institutions are resisting enclosure of scholarly articles by developing and implementing policies requiring open access to the research that they support. There are over 200 such policies around the world, as listed in the Registry of Open access Repository Material Archiving Policies (ROARMAP). Some policies are top-down, while others are faculty-led. From my perspective, it is in the best interests of scholars to lead in developing open access policy. The faculty-led policies of Harvard and MIT, in addition to promoting open access, also assert or reassert the rights of scholars to grant licenses for their works to the universities. This is an effective way of limiting the possibility for any broad-based commodification of scholarly knowledge.

Conclusion

The discipline of communication has not undergone as much enclosure as some other disciplines, particularly in the areas of science, technology and medicine (STM). Scholarly societies maintain a large portion of the market, and even retain control of many of the journals that are in the hands of the transnational corporations, and there are still independent publishers in the market. Hence, communication scholarship is in good shape to transition to a more scholar-friendly, open access environment. There are now a hundred fully open access journals listed in the Directory of Open Access Journals under the subject Media and Communication Studies. Scholars or scholarly societies wishing to move into independent publishing will find that a large percentage of universities (usually

through the library) can provide hosting and support services for journals. Scholars can self-archive their work in institutional or disciplinary open access archives. Funding agencies, universities and research institutions throughout the world are developing policies requiring open access to the research that they support. This is an opportune time for faculty to lead the process, and develop policies like the ones at Harvard and MIT that assert or re-assert the rights of faculty to grant rights to the university to their works.

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Appendix E: Communication journals by impact factor (top 10)

JCR Year and Edition: 2008 Social Science

Impact Factor	Abbreviated Journal Title	Publisher	ISSN
2.266	J COMMUN	International Communication Association	0021-9916
2.057	J HEALTH COMMUN	Taylor & Francis	1081-0730
1.972	PUBLIC OPIN QUART	Oxford University Press	0033-362X
1.901	J COMPUT-MEDIAT COMM	International Communication Association	1083-6101
1.689	HUM COMMUN RES	International Communication Association	0360-3989
1.473	COMMUN RES	Sage	0093-6502
1.422	COMMUN THEOR	International Communication Association	1050-3293
1.359	INTERACT STUD	John Benjamins	1572-0373
1.295	CYBERPSYCHOL BEHAV	Mary Anne Liebert	1094-9313

Source: Journal Citation Reports, 2010.