

Locating the Information Society within Civil Society: The Case of Scientific and Scholarly Publications¹

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Abstract

The phrase “information society” appears innocuous enough; yet, a deeper analysis demonstrates that it involves strategic aims which, in effect, serve to control the political debates surrounding the production, storage and reception of information. The limited, yet symptomatic, case of scholarly and scientific publishing helps to unveil some of these issues. Furthermore, it helps understand how anyone with some concern for the health of civil society might think about the information society and how it relates to civil society. In effect, the question raised is: how do we put the information society in its place?

Introduction

How does civil society relate to the information society? Despite parallel grammatical constructions, the two terms do not simply correspond to two different facets of society or two ways of looking at it. Rather than harmoniously complementing each other, the juxtaposition of civil society and information society raises a number of issues and problems. This paper proposes an understanding of their “orthogonal” relationship. The term conveys a tension between convergence and divergence. It also connotes the idea of a historical discontinuity. In other words, orthogonality reflects a contest between two viewpoints where, ultimately, one tries to override the other.²

History is full of such transitions. In a sense, two successive paradigms—in the Kuhnian sense³ of the term—are orthogonal to each other because they cannot be compared to each other and, in a sense,

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² The creation of the Royal Society is a useful example. In Europe in the seventeenth century, science emerged as an empirical form of knowledge, separate from political and religious forms of discourse. Modern science, it could be said, initially emerged orthogonally to politics and theology before trying to subsume them both. See Poovey (1998), especially chapter 3.

³ See Kuhn's *The Structure of Scientific Revolutions* (1996).

speak past each other. More fundamentally, shifts in the very epistemological foundations of whole cultures can also conform to this kind of transformational scheme. The very term information society implies a degree of historical discontinuity, something revolutionary, which would replace what was there before. Civil society as an organizing paradigm has been portrayed by the information society apologists as a precursor to the information society, which would mean that civil society was subsumed and transcended by the information society. Conversely, because of the growing vigour of the associations, networks and other forms of human collectives, civil society claims its own existence and a strong capacity for drawing upon information. As a result, civil society can also be seen as a form of future for the information society, rather than its superseded past.

Positioning civil society in the past or the future of information society is a useful way to characterize the current struggle between these two methods of mobilizing organization. The point of this chapter, in fact, will be to explore how civil society can emerge against and through information society in such a way as to integrate it within a civil society framework. If the information society (as a concept) is to survive at all, it ought to be within the framework of civil society, and not the reverse.

The point of locating the information society within civil society is to subvert the functions generally assigned to the former. The phrase information society can be taken as a concept; and information, taken as a scientific term, conveys the idea that social problems are best resolved scientifically. From this perspective, politics is seen as something best avoided. Many discussion lists found on the Internet and relating to Internet policy are laced with comments such as: "may we keep the politics out of this question". Ultimately, the point that must be raised with regard to the information society is whether it is not often called upon precisely to neutralize political debates, and thus to help foster a particular, but hidden, political agenda under the banner of objective, rational and quantifiable knowledge.

Simply rejecting the notion of information society is of little value to oppose apparently scientific or objective justification: counter claims of irrationality quickly follow. Positioning information society within civil society appears more useful to respond to this kind of challenge; moreover, it facilitates the possibility of translating political objectives into a variety of policy frameworks and into a number of operational projects.

The issues just raised are obviously complex and cannot be fully covered within these few pages. The text that follows will limit itself to exploring some of these questions through a case study of scholarly and scientific publishing. Although this publishing area directly touches only a tiny minority of people in the world, it locates itself at the heart of

research and, as such, at the core of data, information and knowledge production. At present, it has been transformed by globalization, including corporate mergers, like many other spheres of the world economy. As a result, it offers concrete, yet rich, insights into the whole notion of the information society, even though it has little to say about mass media in general or the massive commoditization of cultures. While it has a global effect, it is structured enough to lend itself to a relatively limited analysis. Finally, its complexity, while not overwhelming, is sufficient to allow it to touch most of the key elements that can help in thinking about how to position the idea of information society within civil society.

Scientific Information and Civil Society: A Cautionary Tale

Replacing excellence by elitism

Although scientific and scholarly publishing shares many characteristics with publishing in general, it also sports a number of interesting specificities as well. Unlike general commercial publishing, scientific and scholarly publishing fulfils several specific functions at once: while it serves as a communication system between peers that are both authors and readers, it also acts as a living memory and a kind of jurisprudence for science. Through scientific publishing, an author can point to a date of reception, revision or, at the very least, of publication to establish priority claims and the paternity of discoveries, observations or inventions. Finally, scholarly publishing is carried out through a wide range of journals whose prestige, visibility, authority and so on, range from the barely credible to the highly prestigious. In other words, publishing also acts as a “branding device” for scientific authors. In scientific publishing, unlike most other forms of publishing, direct financial profit is not of primary importance for the authors. Even for publishers, financial considerations would take second place, particularly in the case of learned societies and other largely non-profit organizations, although sometimes commercial publishers did find a symbolic value in publishing scientific journals.

In the last 30 years or so, however, the situation changed radically to the point that today, some of the highest profit levels encountered in the publishing industry are found within scientific and scholarly publishing.⁴ The transformation of the economic sphere of scientific and

⁴ As an illustration, the 2000 Report from Reed-Elsevier revealed that its STM (science, technology and medicine)-adjusted operating profit margin was 36 per cent, well above the company-wide level of 21 per cent profit. Source: message sent to the Reedelscustomers list

scholarly publishing is all the more striking since scientific authors are almost never paid for their contributions,⁵ and peer review is generally done for free. At the same time, the research results published in scientific and scholarly publishing are the results of efforts financed primarily by public or foundation funds. Finally, scientific publications are bought mainly by libraries, which are also generally supported by public or non-profit funds. As the price of scientific and scholarly publishing goes up, the proportion of subscriptions paid by individuals tends to diminish—a situation easy to understand when the annual subscription to a science journal usually exceeds \$1,000.

Traditionally, in the eighteenth and nineteenth centuries,⁶ scientific journals were linked with scientific societies or academies, and the publication costs were borne mostly by the parent institution (see Kronick 1976). A small fraction of that cost was recovered by a number of private subscriptions, but bartering was also practiced on a large scale, so that, with a few dozen copies of the local journal and through judicious exchanges, a rather significant collection of publications could be developed. In effect, each scientific institution was promoting the best work of its own scientists by bearing the financial burden of the local journal, memoir or transaction. By attracting papers from recognized foreign scientists, its reputation was further enhanced. In this fashion, the validation and circulation of scientific ideas was achieved at a cost that was closely related to production costs. Being universal in nature (and apolitical in content), scientific knowledge could generally percolate across political boundaries and ideological or religious differences without much difficulty.

From the middle of the nineteenth century onward, the rapid growth of research communities translated into an equally rapid growth of scientific journals: a few dozen periodicals gradually grew into hundreds of titles. In parallel, learned societies found themselves involved in a publishing process where speed and efficiency became ever more important: securing priority in an increasingly competitive context demanded being published as quickly as possible. The failings of scientific societies and associations in this regard opened a window of opportunity to commercial activities, but it did so in a particular fashion. Commercial publishers knew that while scientific and scholarly

hosted at the University of Texas by Bob Michaelson (Northwestern University Library) on 27 March 2001.

⁵ They generally carry out their research within the context of an academic or research position and they are paid a salary for this. Interestingly, if most researchers have managed to preserve an “author” status despite a context that could have easily led to a “work for hire” situation, it is largely due to the fact that no money is involved in scientific publishing, unlike patents.

⁶ It is generally agreed that modern scientific publishing began with the appearance of the *Transactions of the Royal Society of London* in 1665.

publishing could not really be profitable in itself, these publications could be prestigious and therefore adorn a publishing catalogue. Moreover, they facilitated good relations with scientific authors who might decide to write more than mere scientific articles, for example manuals or treatises, which could be profitable.

Until the Second World War, scientific and scholarly publishing remained essentially stable, and commercial publishers remained valuable minority partners in a venture that was still largely disconnected from profit motives, even though financial concerns were never absent. The presence of commercial publishers imposed a useful, even healthy, check on learned institutions that, otherwise, might have quickly succumbed to various forms of complacency translating into unacceptable publication delays and unpalatable forms of corporatist censorship.⁷ The situation, however, evolved rapidly after the Second World War. The rapid growth of scientific research led to a rapidly expanding system of scientific publications, and this quantitative mutation brought about its own series of problems, in particular, a growing concern about retrieving scientific information. There was concern in the 1950s that bibliographic methods in science had fallen so far behind that science would drown in its own documentation. Emblematic among many, the famous *Chemical Abstracts* published by the American Chemical Society had always relied on a network of volunteers and was falling further and further behind. In the context of the Cold War and the growing commercial competition with European firms, such difficulties triggered a flurry of research activity into new retrieval methods.

It is in this context that Eugene Garfield was prompted to study new approaches to scientific literature, resulting in the Science Citation Index (SCI). However, Garfield's solution to the problem of scientific information retrieval unwittingly set a series of unintended consequences in motion, the results of which were anything but positive.

Garfield managed to translate Bradford's law of distribution⁸ into a law of concentration, thereby giving himself the possibility of approximating the whole of scientific publishing with a core collection of journals that, at first, stood around a thousand titles.⁹ While statistically, the approximation can be defended, it translated into the defining of a core set of scientific journals, with definite boundaries, and provided a

⁷ For example, statistics (for political reasons) and phrenology (for more substantive and epistemological reasons) were both subjected to censorship in nineteenth century Britain.

⁸ Bradford's law of distribution states that, in a search for journal articles on any one subject, a small group of core journals will provide one-third of the articles, a larger group of "less-core" journals will provide another third, and a large number of peripheral journals will provide the remaining one-third.

⁹ On Eugene Garfield, see Wouters (1999).

private institution—the Institute for Scientific Information (ISI), Garfield’s own company—with the enormous power to select which journals would be included in SCI, and which, conversely, would be excluded. In other words, the pecking order of scientific journals that had always continuously extended from mediocrity to excellence had been surreptitiously transformed into a two-tier system: journals inside ISI and journals outside it. Excellence had been covertly redefined as elite—a substitution that was apparently highly satisfactory to a number of institutions that were already in the habit of viewing themselves in that light.¹⁰

The first unintended consequence of the SCI was the creation of this elite, which upset what used to be a competition for excellence.¹¹ However, the elite-producing mechanism started by SCI was about to be reinforced quickly and thus induce a far more negative consequence. The Garfield approximation being presented as representing “core science”, libraries began to use it as a benchmark, with the result that many of them began to acquire roughly the same collection of journals. As the core set gradually increased to several thousand titles, most libraries eventually settled for buying all or most of this set. In effect, the major research libraries of North America had begun to view the ISI core set as the “indispensable” set of journals.

Such a co-ordinated concentration of interests could not go unobserved for long, and indeed large commercial publishers began to take note of the fact that the scientific and scholarly publishing market, long viewed as a marginal, if prestigious, activity, had turned into an inelastic market with all the profit possibilities attached to this notion.¹² This was the second unintended consequence of the idea of a core set of journals. Beginning in the late 1960s, commercial publishers began to acquire a variety of journals that belonged to the enchanted ISI set with a view to recouping these investments as quickly as possible through steep price rises. Thus emerged the so-called “serial pricing crisis”, which began

¹⁰ As the words “excellence” and “elite” are often used as synonyms, it is important to underscore the difference maintained here. Excellence is an ideal that everyone is supposed to strive for. In so doing, a continuous hierarchy or pecking order develops, based on the competitive qualities of the scientists; by contrast, elite is marked by one or several procedures aimed at including some and excluding others, thus creating a discontinuity among scientists. Being part of an institution or not, being listed in SCI or not, are examples of elite-creating procedures. See also note 11.

¹¹ At least nothing indicates that it was conceived as anything more than a pragmatic response to the problem of tracing in a credible way, some manageable subset of all the scientific citations published in all the scientific journals in the world.

¹² An inelastic market is one where demand is little affected by rises in costs. It allows monopolistic behaviour to flourish. One of the first individuals to size up the potential of the emerging situation was Robert Maxwell who created Pergamon Press in 1951 (Cox 2002).

affecting the workings of research libraries. This crisis deeply affected the globalization of scientific research results in the following ways.

Libraries are now buying a smaller fraction of the scientific literature than they did 20 or 30 years ago. This is happening despite significant increases in their acquisition budgets and despite the transfer of funds from monograph budgets to scientific periodicals.

This in turn has affected the market for scholarly monographs, which form the main vehicle for scholarly publications in the humanities and the social sciences. This, in turn, has made university presses more fragile and, as a result, more cautious in their editorial choices. One of the consequences of this state of affairs is that young scholars in the humanities and the social sciences are finding it more difficult to publish their first monograph on which their promotion and/or tenure depend.

Libraries in poorer institutions, and especially in poorer countries, have essentially been cut off from the current flow of scientific information with sometimes dire results. For example, until the World Health Organization (WHO) stepped in with the Hinari Project, core literature dealing with malaria was essentially inaccessible in many countries where malaria strikes and kills. How many lives have been lost because of this situation, no one knows, but it cannot have been insignificant.

Scientific societies, upon observing the price increases imposed by large publishers, began to take advantage of the new situation in order to better finance their various activities, including those related more to professional goals—for example, lobbying efforts—than to scientific aims.

The sharply rising price of journals led to major cancellations of subscriptions on the part, first, of individuals, and then of libraries. With the decreasing number of copies sold, prices began to increase even faster and, as a result, the quality of access to scientific information began to be concentrated in a decreasing number of rich institutions. If rich institutions adopt a cynical viewpoint, this situation may appear positive since it provides a new kind of competitive advantage to their own researchers. In a knowledge-based economy, where high returns accrue to the development phase—itself closely tied to fundamental research—such a concentration of the knowledge base in a few institutions, located mainly in countries of the Organisation for Economic Co-operation and Development (OECD), may not have been seen as such a bad thing after all.

The end result of these trends is clear: what could have been legitimately described as a “republic of science” before the Second World War has, since about 1970, turned into a form of growing elitism¹³ that

¹³ Again, to clarify what elitism means here, it is important to underscore that practicing science has always been an elitist activity. Science always set itself apart from the rest of society, for example by relying on a set of credentials (diplomas) needed to ensure basic

has replaced the earlier competitive quest for excellence; as this elitism is now kept in place and even intensified by financial means, it can be said that the republic of science has now given way to a scientific plutocracy—hardly a positive outcome!

Digitization and networks

At the very end of the 1980s, the Internet began what might be termed its public life. Starting with the universities and reaching a wider audience after 1995, the Internet, acting as a kind of trade language for all types of computer networks—a kind of meta-network in fact—began to take on the appearance of a materialized communication system of global proportions. As could be expected, scientific publishing took notice, and commercial publishers proceeded to explore ways to preserve and even improve their financial situation within the new digital context. Tulip (The University Licensing Program), the experimental project led by Elsevier from 1991 until about 1995, is emblematic of these efforts. The “I” in Tulip stands for “license”, and it represents the most significant shift in this experiment. Elsevier had taken a leaf from the book of software companies and transposed it to journal publishing. Digital content appeared simply too volatile to be sold in the way printed journals had always been sold. For example, the “first sale” doctrine in copyright law allows the owner of a book to lend it to others and to sell it at will; however, this provision obviously put the control over the circulation of digitized scientific information at risk. Making a perfect copy of digital materials is very easy and not costly enough to limit the replication of sold materials. If the menacing perspective of a worldwide network is added, through which the copies can spread everywhere at little or no cost, it becomes clear that the publishers’ revenue streams could disappear very quickly. In short, from a publisher’s perspective, the traditional transactional framework of the print world was unfit for a digitized and networked environment. Something else had to be found, and licensing was the answer.

Because scientific documents are generally small enough to go easily through narrow bandwidth and because academics had early access to the Internet, scientific and scholarly publishing experienced the future early, so to speak.¹⁴ The difficulties, however, were in no way limited to scientific publishing; and other forms of cultural documents—first music

credibility. What is new here is that a new order of elitism has appeared *within* science, marginalizing the old continuum from mediocrity to excellence. In science, a number of mechanisms including the ones affecting scientific and scholarly publishing and adumbrated here, have contributed to setting off a number of institutions and individuals sharply apart from the others. See footnote 9.

¹⁴ Although the comparison is technically inaccurate, it would not be false to point to Paul Ginsparg’s early physics database at Los Alamos as the philosophical prototype of Napster.

recordings and more recently movies—have since encountered similar difficulties. In a sense, for the publishing, recording and film industries, scientific publishing was a little like a canary in a coal mine.¹⁵

Already the photocopy machine had shown that scientific articles could no longer be chained to a particular issue of a journal. However, photocopying still required physically accessing the original issue and physically bringing it to a photocopy machine, which took some time and, generally, some money. Also, the copies, although usable, were less than perfect. In short, photocopies did not threaten sales, particularly to libraries, and the habit of photocopying mainly reflected the desire to keep the literature permanently close to one's place of work—office or laboratory. More recently, desktop access to digitized literature has capitalized on that very point, as it is local accessibility that makes it so appealing to scientific investigators.

Photocopying books was far less appealing: the process was cumbersome and sometimes costlier than the book itself, while the result was always a bit unwieldy: storing such “books” has always been somewhat awkward. In short, publishers could rest content with the notion that book photocopying was at worst a marginal phenomenon with limited financial consequences.¹⁶

Initially, music recordings were better protected against copying than books: tape recorders were cumbersome and significantly degraded the quality of the source. But now, with digital recording, CD burners copy the source perfectly. At the same time, the growing efficiency of the compression schemes allows transmitting songs through the networks relatively comfortably. The result has been what is known as the peer-to-peer phenomenon, first spectacularly illustrated by Napster and now more discreetly extended by secure, decentralized and anonymous exchange schemes, such as Freenet. With CDs carrying over a hundred songs and even movies, local networks of friends bypass the electronic networks altogether. In short, we are fast coming to the point where no material is immune to perfect copying and transmission—a situation that scientific and scholarly publishing has known for the better part of a decade by now.

¹⁵ Coal miners had the habit of carrying a canary in the mines because, being more susceptible to carbon monoxide than human beings, the bird acted as an early warning system.

¹⁶ However, some French publishers have led a campaign against the so-called “photocopillage”, a pun on “photocopiage” where the connotation of “pillage” is introduced probably because of its metonymic relationship with piracy. However, these publishers, such as Galilée, publish slim essay volumes with relatively high prices. The public's anger against this practice, coupled with the relative ease and low cost of copying, obviously conspire to encourage photocopying, however illegal it may be.

Front lines and their contours

If we take digitized and networked scientific and scholarly publishing as the canary of information industries, its evolution allows us to observe the shape of things to come and it provides some fascinating insights. In responding to the challenges of the digital context, publishers have essentially explored three independent routes: one legal, one technical and one social. The hope is that, together, these three avenues can form a new publishing device where full control over the circulation of the published materials can be fully restored and, as a result, electronic commerce of electronic materials can be made profitable.

Moving to a licensing scheme is part of the legal move: it allows locating all informational transactions within contract laws rather than the copyright or authors' rights framework. As a result, annoying clauses such as "first sale" can be dismissed. For example, librarians discover that they must negotiate interlibrary loans because access and use are restricted to the local constituency in the license. Moreover, as libraries are essentially dispossessed of actual ownership of the materials, librarians have very little to say about the organizing of the documentation (for example, through cataloguing schemes¹⁷) and its preservation. Obviously, such reworking of the framework of informational transactions affects access, navigation and, ultimately, the appropriation of knowledge.

At the same time, there is a worldwide movement to extend copyright and authors' rights: the United States has recently lengthened copyright laws to 70 years beyond the author's death to bring it in line with many European countries (and to 90 years beyond first publication in the case of a corporate "creation" such as Walt Disney's Mickey Mouse). Moreover, several new copyright laws, such as the Digital Millennium Copyright Act (DMCA) in the United States, try to protect technical copy protection schemes by essentially prohibiting reverse engineering on them.¹⁸ All this is supported by a very aggressive

¹⁷ By creating a cataloguing order that maps knowledge and its divisions in a certain way (such as the Dewey, Cutter, or LC cataloguing systems) and by creating research aids and bibliographic tools, librarians add an applied dimension to the understanding of the structure of knowledge. To some extent, phrases such as "epistemological engineering" or "applied epistemology" convey this important element of librarianship.

¹⁸ The question of reverse engineering in favour of interoperability generally remains valid in Europe but at best constitutes a murky point in the new US law. An example of this is deCSS (Decryption of Contents Scrambling System), a piece of code allowing circumvention of the DVD protection scheme that divides the world into various incompatible zones so as to facilitate various regional pricing strategies. According to its author, the cracking of this particular code was not done with the idea of piracy in mind, but to allow DVDs to be played on computers using the Linux operating system, which happened only after the industry had refused to release suitable drivers for this system or even to collaborate to help code such drivers.

surveillance system aimed at bringing to court anyone skirting the boundaries of the new laws.

On the technical side, new forms of technical “locks” are being tested in attempts to reconstruct the material stability of the printed or analogue universe. Ranging from outright cryptographic approaches to covert “tattooing” (steganography¹⁹), these methods either try to prevent unauthorized copying or to increase accountability by providing ways of determining the source of an allegedly pirated copy. Present dispositions of the law, such as the right to make copies for private use, complicate these efforts, but the aim of the content industry is to push back such rights as far as possible by constant (and costly) recourse to the courts, leveraging financial clout into favourable judicial jurisprudence. At the same time, armies of lobbyists work to influence new legislation where it really counts: Washington and Brussels.²⁰

However effective the legal and technical measures may be, policing on the ground remains important and may even be the most important link in the whole control machinery. Enforcement, in the end, depends on the efficiency of the systems designed to watch, discipline and punish.

Here again, scientific and scholarly publishing provides an interesting example of how this is done. Faced with the question of how to protect their content, publishers have used the legal framework to assign responsibility for the terms of the contract to those buying the access rights—namely, the librarians. As a result, librarians are being asked to perform a series of tasks, many of which were previously alien to them, such as to positively identify that a particular person is a legitimate member of the constituency and to verify that this person is doing only what he or she is allowed to do. Relying on the physical space of a library is no longer sufficient to define access rights and librarians have had to negotiate hard to protect what amounts to (local) open access in general.²¹ As a general rule, anyone able to walk into the library can access the materials located within the building; once outside the library, however, various schemes such as proxy servers or passwords are used to ensure that readers are actually members of the institution that paid for access rights.

Obviously, content owners try to protect their content while shifting the burden and cost of enforcement onto others. In this regard, asking a

¹⁹ A form of cryptography that hides information by embedding messages within other, seemingly harmless messages. See www.jjtc.com/Steganography.

²⁰ For example, Reed-Elsevier is rumoured, from well-informed sources, to have 20 full-time lobbyists in Washington.

²¹ The Bibliothèque nationale de France offers an amusing counterpoint to this theme: having digitized a number of works that are still protected by the *droit d'auteur* (authors' rights—the continental flavour of copyright) laws of the country, they limit access to these digital documents to people who are within the walls of the institution, thus defeating one of the advantages of the digital document, namely, ubiquitous access.

fraction of one's customers (librarians) to watch another (scholars or scientists) is brilliantly Machiavellian. At the beginning, these shifts were poorly monitored because they appeared simply insignificant, compared to the vast technical and legal transformations then affecting the librarians' work. As a result, a measure of acquiescence could be secured without even a debate. Quite subtly, a whole series of rights were surreptitiously eroded in the midst of brave talk about unending technical progress and the wonderful advent of an information society providing a bright future to "information services" that used to bear the simpler name of libraries.

It is precisely in this kind of context that the term "information society" comes in handy. Marketing professionals invoke it to focus everybody's attention on the ease of management that the new technologies offer to librarians and on the improved desk access for the end users. In effect, the marketing divisions of the large commercial publishers have been able to create language that serves their ends without revealing them too openly to the mesmerized listener or reader. Moreover, they can claim that this wonderful new technology costs quite a bit in research and development, and therefore, customers must understand that these wonders come at a price. In a nutshell, and in the context of scientific publishing, the information society appears as a device designed in such a way as to serve commercial ends while hiding more political (and sensitive) questions such as those of access. It substitutes itself for the real questions around issues such as collection building and preservation, optimizing access for local users, and creating the navigational aids that differentiate an average library from an excellent one. And it does all of this in the name of progress. Of course, the obvious presence of technical progress gives credence to the argument, but at the cost of a deplorable confusion between itself and social improvement.

Interpretation dilemmas and their meaning

How should such events be interpreted? While they certainly reflect the aggressive strategies deployed by the publishers to conquer new markets, they also reflect their deep-seated fear that long-standing business plans that have provided steady revenues for decades are coming to an end. Some publishers—generally the rich and technically savvy ones—forge ahead and invent new models designed to assure financial success in the new digital context; other publishers—generally smaller and less technically competent—may just try and simply behave in what can be seen as a reactionary manner. Faced with the uncertainties of the future, and seized by a fear of disappearing, these publishers unconsciously ape the French nobility before the Revolution, trying to shore up their weakening economic base by restoring, firming up or extending laws that

had fallen into disuse for decades. That phase of French history, known as the *réaction nobiliaire*, or the reaction of the nobility, not only turned out to be ineffective, but even became counter-productive: by increasing popular resentment against a system of inequities that was becoming ever more unbearable, it precipitated the advent of the revolutionary events of 1789. Likewise, some publishers in search of extended forms of revenue have advanced rather strange arguments, including the alleged loss of revenues generated by library loans of books.²²

Whether the present trends in copyright laws reflect a kind of *réaction nobiliaire* on the part of the publishers, or whether they are the expression of a growing greediness on the part of capitalistic companies, the very difficulty in determining which is which indicates that it is a contest that has not yet ended. In other words, looking at scientific and scholarly publishing reveals a confusing field where the early advantage enjoyed by commercial publishers continue to be exploited although it no longer guarantees them final victory. New alliances are emerging that bring into view possible forms of publishing that radically depart from the older models. Large, commercial publishers still hold the upper hand, but the frantic pace of mergers is not simply a quest for size, clout and efficiency of scale; it also reflects doubts and uncertainties and the need for defensive moves.

How segments of civil society made themselves heard

The combination digitization/network also attracted the attention of a number of scientists and scholars who began to design new communication tools—in effect new “electronic” journals. In so doing, they began to uncover some of the hidden dimensions of scientific and scholarly publishing that had long remained hidden, thanks in part to the work of librarians that had been only too efficient at creating the illusion of free (or costless) access. Scientists such as Stevan Harnad began looking more closely at the new technical possibilities. They began to consider that, from the perspective of publishing scientists or scholars, locking their writings behind a subscription scheme was counterproductive, if not downright stupid. However, scientists also need journals to establish that their work has been subjected to the peer review process, and, even more importantly, to benefit from the reputation bestowed by a given journal.

One of the options looked at was the freeing of content after a short while, a concept that is now being discussed in terms of a “moving wall” system; David Shulenburg’s “NEAR” (National Electronic Archive Repository) concept proposed a three-month delay, and the Public

²² French publishers, once again, have been engaged in this type of battle for the last couple of years. The fact that most are not very large or technically oriented may partially account for their tense, essentially reactive, attitude.

Library of Science (PLoS) petition in 2000 proposed a six-month delay. However, these suggestions were still trying to establish a compromise with the existing system. A more radical option was to grant immediate open access.

Scientists, fundamentally, want peer review, prestige *and* free access. The library scheme in effect provides a kind of institutional entitlement to reading rights, and most scientists have acted as if it were equivalent to free access. However, this entitlement does not directly or even satisfactorily respond to the desire for optimal visibility, which, in turn, may fuel authority and prestige. Only with true open access can scientists and scholars hope to move beyond the Faustian bargain²³—giving one's copyrights to publishers in exchange for their branding capacity, all the while allowing them to milk (largely) public institutions and enjoy rather extraordinary profit margins.

Initially dispersed and unco-ordinated, these various expressive forms of protracted resistance began to converge, thanks to a meeting that took place in Budapest in December 2001. At the invitation of the Open Society Institute, about a dozen scholars, scientists and librarians convened to discuss these issues and explore action plans. The importance of the Budapest Open Access Initiative (BOAI) that emerged from this meeting lies in the fact that it began to bring direction and strategic coherence to the various groups trying to reform scientific publishing. It also focused squarely on the issue of free access, creating a new clarity of vision as well as some language to counteract the statements coming out of the discourses relating to “information society”.

Among the initiatives that preceded the Budapest meeting was that of Harold Varmus, a Nobel Prize winner, who tried to convince medical journals to free their content into PubMed Central, a database sponsored by the United States National Institutes of Health (NIH). The reaction of medical journals, especially the *New England Journal of Medicine*, was anything but acquiescent. As a result, the PubMed Central project was quietly transformed into an open access repository for refereed, open access journals. It also became a guaranteed preservation site for open access publications.

A commercial outfit from Britain, BioMed Central (BMC), took advantage of PubMed Central to increase the credibility of its own venture. In BMC's scheme, authors retain their copyright, articles are in open access and NIH's PubMed Central guarantees preservation. The business plan of the venture rests on the idea that each article accepted and published will cost \$500. The cost can be borne by a granting agency, an institution or even a foundation. Special, lower prices have been established for poorer countries, and subscription rates for unlimited

²³ Stevan Harnad's phrase (Harnad 1995).

access to publication have been designed for various institutional sizes. PubMed Central provided the institutional guarantee that BioMed articles would remain in open access, no matter what happened to the commercial venture.²⁴

With the multiplication of open access journals in the Web, the advent of BioMed Central, and, more recently, the announcement of an important grant (\$9 million from the Moore Foundation) to PLoS to create two large, prestigious and open access journals in biology and medicine, the issue of open access began to gain visibility and credibility. As a result, a growing number of organizations, both public and private, are studying the question, and it has become a hot topic in the academic world, as many recent conference programmes testify. At a recent meeting at the Hughes Medical and Health Institute—a foundation financing medical research—representatives of the Wellcome Trust, NIH and the Max Planck Gesellschaft, as well as several foundations attended. The issue was open access and how best to promote this in the biomedical world. The meeting resulted in the Bethesda Statement, which committed the participants, including librarians, scholars, and public and private funding agencies, to support open access.²⁵

The importance of open access is that it completely overturns the usual publishing pattern used by scholarly and scientific journals. Instead of adopting a sales model that, in the case of research results, appears both artificial and somewhat ill-adapted to the finalities of scientific communication, open access effectively liberates content, not in the sense of placing it in the public domain—open access schemes all rely on traditional copyright and to that extent remain impervious to changes in copyright laws²⁶—but in letting it circulate according to the wishes of scientific authors. At the same time, it proposes a sustainable economic model and this could lead to two important consequences: redirecting the role of scientific publishers in new ways, and introducing a degree of transparency with regard to publishing costs and pricing.

It redirects the publishers' functions because it brings about the need to clearly delineate the border between editorial and publishing functions. In scientific research, a large part of the editorial function is

²⁴ The purpose of BioMed Central and its future can indeed be questioned: is it a real commercial business or is it simply a commercial venture testing a new business model in order to sell it? Should its viability be clearly demonstrated? Could it even be a front for a test covertly financed by some large commercial publisher(s)? The future will tell, but, whatever the answer, BMC was the first to tie up the question of open access with financial (and even commercial) sustainability and that represented a very crucial step in the evolution of open access thinking.

²⁵ www.earlham.edu/~peters/fos/bethesda.htm.

²⁶ Even if intellectual property were to reach the state of perpetuity, just like ordinary property—a dream pursued by publishers since at least the sixteenth century—it still would not prevent owners from placing it in open access. Legally, granting open access to a document is not equivalent to giving it away or placing it in the public domain.

covered by peer review and the publisher's role is actually quite limited. This is particularly true in a digital context where the publishers' contribution essentially corresponds to file markup, database constructions, cross-referencing and similar tasks. The share of the work done by the publisher may even decrease with time, as open (and free) publishing platforms are increasingly available, enabling any reasonably savvy user of a computer to be quickly empowered into a full-fledged publisher.

Costs will be affected too. If open access publishing really takes root, collections will be have to be interoperable—a hypothesis that is already strongly supported by the existence and vigour of the Open Archive Initiative (OAI). OAI actually refers to standardized sets of meta-data allowing for the one-stop harvesting of distributed sites; it also allows identification of these sites, separating them from the general anarchy of the Web. As such, OAI is indeed fundamental if all these sites are not to become so many intellectual ghettos.

Once this interoperable point is reached, those who pay—institutions, granting agencies or foundations—will naturally try and balance visibility and prestige versus cost, and the “bang for the buck” syndrome will kick in. There will also be competition between various types of repositories, and it will be directly conditioned by the amount publishers charge for publishing and reviewing as well as their prestige and authority. Unlike the “core journal” system and its inelastic market, which allows publishers to divorce pricing from production costs, the new system will reintroduce cost as a factor. For example, if BMC does not manage to grant as much branding value as PLoS, it will have to keep its publishing fee below that of PLoS to attract a second-tier category of authors. And if PLoS raises its fees too high, new players will quickly step in to provide equivalent branding at a lower cost.

Obviously, the stakes are high, which explains why a number of publishers, including learned societies and publishing associations, are beginning to look into this issue with a great deal of attention (and trepidation). Open access experiments are clearly converging toward one single and simple objective: how can they construct excellent (and recognized) branding and evaluation systems in order to create the best “symbolic capital”—to use a concept borrowed from the French sociologist, Pierre Bourdieu—within a viable economic framework?

Curiously, open access does not necessarily work against commercial and even monopolistic interests. In fact, should a publisher like Reed-Elsevier or Taylor and Francis decide to capitalize on its branding capacity potential through its journals, it might decide to go down the open access road and, with the help of its well-established branding devices, price its products so as to maintain or perhaps even improve its revenue stream. The success of this strategy will depend on the entry cost for competitors. If \$4–5 million are really required to start a

successful open access journal, such as the two journals launched by PLoS, such a high entry cost should reassure the big commercial publishers to the point that they might even see open access as a viable business plan. Alternatively, if very credible and ultimately prestigious journals can be created for a very reasonable price, then traditional commercial publishers will face a new and very threatening form of competition.

In short, the transformations and the consequences that will result from open access are so complex and difficult to predict that commercial publishers will probably tend to play safe for a while. But they are also so profound that they cannot be neglected. It is not by chance that new experiments are originating in universities or with venture capitalists: only milieux such as these are conducive to such daring experiments. This is why the BMC and PLoS experiments are so important. This is also what makes the entire open access movement strategically crucial to anyone interested in the future of scientific publishing.

And if scientific publishing really acts as a canary, it points to fundamental elements in the contest between civil society and the information society. In particular, it shows that commercial discourse, laced with progressive terms as it is, cannot simply be opposed by a counter-strategy such as open access; rather, open access appears as a symptom. It points to the reconfiguration of a contest between public good and private interest. This reconfiguration has largely been invented and (so far) explored by supporters of the public good, in effect by civil society elements. However, its usefulness is not beyond the reach of private interests. In fact, nothing prevents the adoption of an open access model by commercial publishers and, consequently, the elaboration of an information society discourse in addition to it. We can even anticipate its emergence in the near future.

Tightened property rights, protection and enforcement, or overturned business models are the dilemmas in scientific and scholarly publishing at present. If scientific publishing is indeed going to act as the canary in the information society that we are moving into, it is worthwhile to take stock of this contest. The established publishers have generally shown limited originality and a largely reactive attitude. While it is true that relocating information transactions within a contractual framework was inventive, tightening copyright laws, designing better locks and strengthening the enforcement personnel are nothing but regressive. The publishers' aim, as we have seen, is essentially to transpose, thanks to the licensing scheme, all the advantages already held in the print world, and even increase them wherever and whenever possible through a clever use of networked technologies.

However, we have also observed other actors who are rethinking the business model of scientific and scholarly publishing, realigning it in

such a way as to enable it to fulfil its primary function more efficiently, while designing an economic model that provides for sustainability (and perhaps even profit in the case of BMC). These efforts are far more creative and are certainly closer to the primary concerns of scientists. Open access publishing appears more efficient, less costly and just as good, if not better, in terms of providing good foundations for sound scientific evaluations. Whether it fits in with publishers' goals will probably vary greatly with each publisher. For example, existing or future publishers close to scientists (such as scientific societies, university presses or even libraries) will find these new models interesting. More traditional (and more powerful) publishers presently enjoying a steady revenue stream and good profit rates from the existing business models will be far more cautious—why kill the goose that lays the golden eggs? But the potential competition emerging from this unexpected sector is sufficiently credible—and even threatening—to warrant a close watch. Elsevier's Chemweb²⁷ is but one example of this monitoring.

Scientific and scholarly publishing is evolving in a most intriguing way. It displays a growing competition between two fundamentally opposed forms of publishing. On the one hand, traditional publishers merge, change the transaction framework, and try to maintain or even improve their revenue stream so as to improve their bottom line. On the other, new models based on free access mix private and commercial interests with non-profit, goal-oriented ventures, while trying to reform the science communication system to bring it more in line with the needs of all scientists and not just a small elite.

What is interesting in all of this is that the commercial publishers have traditionally and quite spontaneously tended to use the language of the information society as applied to their own field of activity. Technical progress (and its inherent cost) was supposed to justify both its deployment and the increased expenses. Desktop accessibility was pushed centre stage while increased control and reduced rights were kept in the background. For their part, open access groups have tended to emphasize the better alignment of the publishing context with the social and institutional needs of scholars and scientists. Rather than pretending to solve the problems of scientific communication in one sweep, with the use of technology, open access supporters have kept their attention trained on the true needs of scientists and scholars and have looked for ways to take advantage of the new technologies to achieve these goals. As a result, their discourse does not forget technology, but it subordinates it to more political and functional concerns. In short, they

²⁷ Chemweb was originally an experimental open-access repository of chemical preprints with a number of various functions attached to it, in particular discussion groups. It has turned into a sort of alert system for articles and is toll-gated.

speak a language that is also encountered in civil society circles. It is a language that does not shy away from technology, but which, conversely, does not fall into the trap of believing that any problem can be solved through a technical fix, preferably allocated through market mechanisms.

To return to an earlier hypothesis of this paper, if scientific communication can be seen as the canary of the whole information sphere as it is developing nowadays, present trends demonstrate the ways in which the language of the information society can be subsumed in a wider, stronger form of discourse where human beings remain squarely at the heart of the issue, where technology does not appear as a magic wand that can be waved at any social problem, and where issues of power are placed clearly in evidence rather than hidden behind apparently objective technical parameters of all kinds.²⁸

Taking Stock of Scientific and Scholarly Publishing

What does the story of scholarly electronic publishing tell us about civil society and its relationship with the information society? The answer to this question lies in some of the interesting social details. It must be remembered that it all started in the context of a fast-growing scientific enterprise—characterized by the term “Big Science” by science historian Derek de Solla Price. It must also be remembered that the difficulty of ensuring efficient information retrieval through up-to-date bibliographic tools led to innovations that inadvertently modified the market characteristics of scholarly publishing. Some publishers—Robert Maxwell among them—duly noted the shift and ushered in a new phase in scientific publishing, which initially brought no response, except from the library community that was bearing the financial brunt of this change.

Unlike the first phase, the advent of digital publishing coupled with global networks led to the emergence of new players from the scholarly and scientific ranks. Quickly spotted and supported by librarians—the earlier public discussions about electronic publishing often took place within library meetings—these developments were also followed by the commercial publishers. As a result, two essentially divergent movements began to evolve. On the one hand, as we saw earlier, the licensing scheme of the publishers was first experimented with and then commercially deployed around 1996, causing libraries to react to the new, unfamiliar demands by creating consortia to negotiate favourable

²⁸ This is not to say that objective technical parameters can never be used; it only means that they must be put in their place and used within the confines of their true operational reach.

terms for Web site licenses. On the other hand, various groups of scholars began to band together to invent an alternative to the dominant, commerce-inspired, model of scientific journals bought and sold through subscriptions. In these early movements, led since 1991 by the likes of Paul Ginsparg and Stevan Harnad, one can recognize the rise of civil society actors and concerns. Toward the end of the decade, the Public Library of Science movement managed to draw the support of 30,000 signatories in the biomedical sciences worldwide.

Librarians, of course, followed this just as attentively as publishers, as they had always hoped to see some movement that would support their own approach based on open access to information for the widest numbers. It may be said that their action throughout the 1990s was to keep alive the various discussions and debates surrounding what they called the serial pricing crisis, while recognizing that these discussions aimed at creating new forms of publishing rather than merely addressing the rise in journal prices.

It must also be noted that early discussions had more to do with the potential of the new technology than with the political economy of scholarly knowledge. Ironically, early supporters of electronic publishing—including the author of this chapter—harboured a somewhat naive belief that technology alone would bring about all the benefits that are now recognized as being part of a truly societal struggle. One might say that in this first phase, the supporters of electronic publishing were trying to attain a civil society objective while speaking almost the same language as the one being used by commercial publishers—the difference being that the “pioneers” kept advancing cost figures which the publishing industry kept denying (and still denies). The point, of course, was that the pioneers hoped to convince sceptical colleagues or administrators through the apparent rationality of economic arguments. However, the real objective was also to reform the means and processes of scientific communication since the technology was transparent enough to reveal all sorts of possibilities that would obviously subvert many instituted social and institutional relations. Various bottlenecks such as time delays in publishing, fixed lengths for articles, and an inability to carry on debates were all regularly mentioned as being part of the potential of a digital environment.

The resistance to the status quo has fuelled a gradual move toward a more political vision of the situation. Examining how the scientific publication system really worked kept revealing new layers of power, involving administrators, scientists and commercial publishers. The branding process, in particular, the creation of symbolic value which can be cashed in for jobs, promotions, nominations to committees, grants and prizes, gradually demonstrated that commercial publishers, through their ability to support an editorial committee, or create new gate-

keeping roles by establishing new journals, were in fact very much involved with the core of science. So much for purity and disinterestedness! The social dimension of science becomes only too clear when looked at from this perspective of publishing.

What has become clear in recent years is that two different types of concepts have emerged from this analysis. On the one hand, there are new non-profit, civil-society-type organizations and tactics. Libraries have pushed for institutional repositories as a way to create what might be called “conditions of possibility” for new forms of scientific publishing. Foundations have become involved in pushing for open access, and money has consequently been diverted to create new kinds of open access journals. The Moore Foundation grant to the Public Library of Science falls into this category, and so does the Open Society Institute financial support for various open access activities. The Rockefeller Foundation, the MacArthur Foundation and other similar institutions have all made concrete gestures of varying magnitude in favour of open access publishing. All this, supported by growing networks of scientists and increasing numbers of learned societies, can be said to correspond to the kind of dynamics fostered by civil society.

However, and more importantly, some members of commercial enterprises, while continuing to speak the language of the information society, are actively pursuing the goal of establishing new kinds of business within the open access paradigm. BioMed Central, of course, is the prime example here, but other publishers are beginning to test the open access waters with variously sized experiments. Open access is being closely monitored by many outfits, some of whom hover in the grey area between profit and non-profit, mirroring shifts in a society between its learned and professional side. The latter may be non-profit, but it values profits if only to support other kinds of activities, such as lobbying for better status and working condition for its members. Medical associations readily fall into that category.

The latter development may be the most interesting from which to draw more general lessons for civil society when confronting something like the information society. As a first approximation, or a first reaction, some might think it discouraging to see a noble, pure ideal such as open access appearing to be tainted by commercial interests. However, the very presence of entrepreneurs in this context can also point to a different vision that is far more sustainable over the long run: sainthood and purity may be the true ideals we should hold, but the costs of maintaining an impassable interface between the two worlds are enormous. As most churches know, maintaining communities of monks and nuns behind closed walls is viable only in the presence of very precise social conditions. Change only a few of these and the walls crumble. Likewise, the dream of creating a pure, autarchic, open access

publishing probably requires social and institutional conditions that will never be attained completely for long. An occasional grant might create the illusion of possibility, but the more rigorous demands of sustainability reassert themselves promptly with unambiguous results.

This last point is important for the more general topic of civil society's relation with the information society. As science cannot maintain a completely pure profile despite its claims (which nonetheless form an essential part of its credibility and social efficacy), civil society cannot really hope to be a viable, working concept if it sees itself as being purely external to any concept of the information society. The realities (and power) of the commercial world are such that it must exist within a number of tenets, often summarized under the catch-all label of information society. But conversely, abandoning all the ground to the information society would mean simply to subscribe to the myth that the alleged superior efficiency of the capitalist system coupled with the inherent wisdom of the market leads to the best possible world—namely the one we have and into which we are rushing, even as these words are being written.

The important lesson to be drawn from BioMed Central is that, propelled by visions and actions generated by groups that clearly form part of civil society, a group of entrepreneurs decided to try their luck within the wider objectives and values of the open access movement. This example demonstrates two things:

- civil society can indeed subsume elements of the information society; and
- the real debate then may no longer be one based on opposition from the outside, but on defining the legitimate hierarchies and boundaries for each segment of society.

The answer to these questions will have to be limited within the scope of this paper, as it brings in entirely new levels of ideas that would take us too far afield to develop here. The point to keep in mind, however, is that whenever new technology is brought to bear on any social situation, a new question arises which translates the question of common good into a new entity—that of an open infrastructure. In this new perspective, the question of where the infrastructural level begins and ends becomes the most fundamental one. To develop this point, we will briefly discuss the area of “free” or “open source” software.

The Question of Infrastructural Goods

It is interesting to note that the free source code movement in software, like the open access movement in scientific publishing, is divided

between commercial and non-commercial players. In the case of software, commercial firms are often unable to compete directly with various software giants, in particular Microsoft, or to identify a safe niche for themselves. Given this situation, they adopt a different strategy and develop a layer of services, in addition to software that is easily accessible and can be freely analysed. They can do so because, although the software is free (in the sense of free speech), its inherent complexity can make its handling somewhat difficult. In many ways, this is exactly what BioMed Central is exploring in scientific publishing as it tries to build a layer of services (Faculty of Thousand, citation linking and so on) on top of an essentially free-access system. It is, in effect, trying to redefine the boundaries between the infrastructural commons and the proprietary domain.

For their part, some non-commercial software ventures also strive to develop alternative models, for example, Debian in the GNU/Linux world does so because it has portrayed itself as the guardian of a certain free source code software orthodoxy. However, quality is also of the essence and through a somewhat conservative and slightly slower pace of development, Debian has secured a strong reputation for very well thought-out solutions with a high degree of robustness to the point that some companies use Debian as a base for their own distribution. We may be witnessing similar developments in science publishing. In a way, PLoS fits this image, and so do institutional repositories organized by various libraries and university presses. Like Debian, they strive to create an image of excellence; they work on the best branding instruments they can devise. But they also push back the limits of the infrastructure by beginning to provide alternatives to commercial services that may limit the latter's field of action.

The conclusion of this small digression into the area of software is that the distinction between commercial and non-commercial ventures is important, but the fixity of the boundary between the two worlds is not the real problem. What is fundamental is the way in which the commons are defined and how economic activity locates itself with respect to these commons. While it is obviously in Microsoft's interest to lock up the operating system (DOS, Windows) and then use this as a competitive advantage against other companies, it is likewise to the advantage of other companies to help develop alternative operating systems, betting that their free status and their quality will eventually make them attractive to users. In so reacting, these companies are helping redefine both commons and infrastructure, which, of course, must be equally accessible for all. Likewise, open access in scientific and scholarly publishing is trying to redefine what counts as free and universally accessible infrastructure. The attitude of commercial companies, in this regard, is derived not from altruism—which would be unsustainable for

most—but from an intelligent understanding of what is minimally needed to design a reasonably viable business plan. A measure of commons is needed for competitive markets to remain relatively stable. The boundary between the infrastructural commons and the commercial, privatized world is deeply dynamic and can move a great deal from one situation to another.

These developments also provide insights into ways in which civil society and commercial interests (hiding behind the information society discourse) can position themselves with respect to one another. The difference lies in whether the notion of open or free infrastructures is not only legitimate, but also essential for the workings of a healthy economy. Quite often, those who believe in the information society will be easily recognized by their promptness to invoke the famed “tragedy of the commons”—an argument that claims that goods that are not owned privately tend to be badly managed and overused—despite the fact that information, by definition, can never be overused.²⁹ While we should not be confused by allusions to economic situations that do not apply to the cases examined, the possibility of reshaping commercial objectives from a civil society perspective appears probable, resting ultimately on redefining what counts as essential infrastructures or commons.

Information Society and Information Theory: A Deeper Mystification

Upon reflection, the term information society is really an odd one: it seems to limit itself to describing a society dominated in some sense by information—a situation presumably introduced by new kinds of technologies, which appears to introduce a level of conceptual sophistication that, on first glance, appears quite compelling. Where does this rhetorical strength, this ability to convince, come from?

The reason lies largely with the connotations carried by the term “information”. Information theory, as developed by the likes of Claude Shannon and Norbert Wiener, once held the promise of a fundamental rewriting of most knowledge, similar perhaps to the formulation of the theory of relativity by Albert Einstein. Along with the nascent science of cybernetics, the mathematical formalization of information by Shannon revealed its connections with the older concept of entropy used in thermodynamics. As a result, the early 1950s seemed to promise that humanity was on the verge of some gigantic new synthesis. When geneticists began to interpret DNA as a code and, therefore, as information for producing living organisms, it even began to look as if information, energy and matter were all that were needed to account for

²⁹ On this point, Lawrence Lessig is an indispensable reference. See Lessig (2001).

the entire universe. Consilience was well on its way, to use a word revived in a recent work by E.O. Wilson.³⁰

Actually, these developments echo an older tradition, linked in part to the Saint-Simonian movement in nineteenth-century France.³¹ It had already linked communication technologies and human progress: the rhetoric surrounding the deployment of the telegraph and the railroad had enjoyed a fair measure of success in the late nineteenth and early twentieth centuries, and so had the digging of canals such as Suez and Panama. Jules Verne in France and, to a lesser extent, H.G. Wells in Britain popularized such notions, and world fairs, with their celebration of the telephone and electricity, certainly did their part to popularize the conflation of social and technical progress.³²

The rise of new communication technologies in the 1970s and 1980s (Videotex in several countries, Internet in the United States) catalyzed a new round of interest in communication, which reached a frenzied pitch in the early 1990s. The term information highway was on everyone's lips, even though no one knew what it really meant. In France, a super-Minitel based on a full deployment of optic fibre seemed in the offing, while in Canada, telephone companies were floating the idea of a consortium named Sirius accompanied by billions of dollars of investments. The Internet was but one contender then and even as late as 1995–1996, asynchronous transfer mode (ATM) was regularly presented by various companies as a new technology that would encompass the Internet, rather than the reverse. Remarkably, it did not matter which side of the technology was presented since all relied on the aura of information theory. In fact, part of the information frenzy was probably no more than the echo of the commercial competition going on between telecommunication companies and Internet firms.

It is in this context that the expression information society took hold. The fundamental nature of Claude Shannon's concept of information, which Wiener had located as the centre of his cybernetic theory, seemed to ensure an equally fundamental positioning within a promised "new economy", variously known as the *knowledge* or *information economy*. It was a kind of magical economy where no one needed to be encumbered with material concerns, traditional accounting—for example, tangible assets—and common-sense limits on the workings of labour and capital. For example, the leader of Massachusetts Institute of Technology's (MIT) Media Lab, Nicholas Negroponte, has contrasted the new world of information bits to the old industrial world of physical

³⁰ Wilson 1998. The term consilience refers to a coming together of knowledge across different disciplines to create a common ground of explanation.

³¹ Saint-Simon developed a theory that rested on the conflation of social and technical progress. On the Saint-Simonian roots of network philosophy, see Musso (1997).

³² Two books cover this story well: Standage (1998); Mattelart (1992).

atoms, and proceeded to argue that the present civilizational shift he claims to observe is in effect the result of bits substituting for atoms. This kind of “information transform” seemed to promise, as in the case of various mathematical counterparts (such as the “Laplace transforms” used to solve differential equations) a quick, painless solution to whole classes of very complex problems. Those familiar with the TV series *Star Trek* will recognize in this the “Beam me up, Scotty” syndrome, in which transmitting information about solid bodies takes the place of actually moving these bodies through space.

Interestingly enough, the two currently dominant technologies, the Internet and the mobile phone, underscore a fact that early Videotex and network experiments had already revealed—these technologies are appreciated to the extent that they permit a peer-to-peer approach. People have displayed a greater recurring interest for communication than for information for its own sake. The information society has turned out to be at best a “communication society”. In the wake of the latter, civil society, in the form of self-organizing groups, has grown with an ease and vigour rarely seen since the early days of print. Content (or software, as we have seen earlier) is created and copied with an efficiency that threatens to compete successfully with the established publishers and the software industry. It also greases the wheels of protest, particularly the anti-globalization movements that have been able to organize, thanks to their effective use of the Internet.

In short, the information society has been superseded by a communication society and the latter has been working only too well, but not with the expected results. Instead of fostering the deployment of tools aimed at ensuring passive, consumer-based behaviour on the part of users, it has spawned a climate of freedom, sometimes disparaged as “anarchic”, where traditional forms of property, especially intellectual property, have been threatened, encouraging the rise of alternative forms of power.

Ironically, advertising for the communication industry had the vocabulary of a deep revolution, but no one had expected to see the content align itself with these venal claims. Yet, the new communication tools have seemed to unleash a generation of young individuals freed from the shackles that the mass media had imposed on collective perceptions for several decades. Curiously, through co-operative programming (but also co-operative pirating), young people are building new forms of governance and new societal structures that do not necessarily respect older structures and values. In other words, what had been advertised as an information society had veered off in a very unexpected direction.

The prospect of activist individuals who might even rediscover the joy of being active citizens has obviously been too much for a number of

reigning plutocracies. In the case of scientific and scholarly publishing—our faithful canary—the trick discovered by large publishers was to change the legal framework of operation and to recreate a client-server structure that would ensure the continuation of the traditional economic recipes and domination systems. Likewise, since the mid-1990s, the objective has been to rein in the Internet despite its international, distributed structure that defies territorialized legal systems, and this, in part, has been the function (and meaning) of the Internet Corporation for Assigned Names and Numbers (ICANN). It also explains the intensity of the debates surrounding this controversial organization. In parallel, through the World Trade Organization (WTO), World Intellectual Property Organization (WIPO) and changes to intellectual property laws (DMCA in the United States, for example), efforts are being made to prevent “consumers” from reshaping the social relations that influence their social and economic status. What the evolution of scientific publishing reveals, therefore, is that while civil society is split between legal and not-so-legal activities (in part reflecting the credibility or lack of credibility of the political and economic systems in question), the commercial world is similarly split between traditional enterprises and enterprises trying to fit within the new perception of civil society.

Paths of Resistance

The constant theme of this essay has been that scientific and scholarly publishing provides an interesting early warning system to examine how the glittering but shadowy contours of information society are marshalled to favour the deployment of new oligopolistic forms of commerce and, as far as possible, to reduce citizens to the state of passive consumers. It also offers insights into possible strategies to resist and even reverse such trends. The lessons learned in this small area ought to be of great interest to civil society. Let us review some of the more fundamental results encountered earlier, but transposed to the wider society here.

Library consortia have done little more than emulate consumer organizations in the wider world; while they certainly help to keep prices in check and provide some leverage to control quality, they fail to change the basic consumer game and may even occasionally contribute to its reinforcement. Moreover, library consortia have revealed some vulnerability to external manipulation that turn out to be quite useful to the multinational companies they ostensibly challenge.³³ This consortium level of resistance is probably unavoidable and, to some extent, it can be of use; however it provides no real solution, especially over the medium

³³ See Guédon (2001).

to long term. While it squarely belongs to a civil society approach, it also reflects many of the weaknesses of this kind of reaction.

The issues that essentially revolve around the role of commons, open domains that may take the form of a public domain, have been more interesting.³⁴ Open access and free source code are the terms that reflect this debate respectively in scientific and scholarly publishing on the one hand, and in computer programming on the other. In the broader terms of civil society, it coincides rather well with the language of infrastructures conceived as the necessary basis for a healthy economy.

Locating the infrastructure and clarifying the border between infrastructure provision and service activities is more fundamental than the commercial/non-profit dichotomy. The point of locating an infrastructure is not so much to oppose commerce as it is to facilitate healthy forms of commerce, and resist monopolistic and oligopolistic forms of behaviour. The equilibrium between the infrastructural commons and the private sphere should be viewed as dynamic.

The best examples of successful infrastructural projects rest on a distributed philosophy, which displays particularly robust forms of social organizations while fostering results of particularly good quality—results that do not cease to astonish the factory-based forms of organization that currently dominate productive activities. What must be noted here is that this ability to network in a distributed manner is very much at the heart of the association style of civil society. In other words, in discussing the relationship of civil society with the information society, we must reach the conclusion that the best way—perhaps the only way—to develop a good, healthy economic system is to rely on the vitality of civil society and its ability to help people come together and work together, preferably in open networks. This is equivalent to stating that a healthy economic society must work on infrastructural bases that are best left under the responsibility of civil society.

In short, and in conclusion, technologies are being deployed according to various agendas, as always. In our age, the capitalist vision of large multinational companies usually dominates and is often couched in universalistic terms that also aim at reducing everything to one simple, basic principle: progress. The information society discourse appears to be one kind of language that has been used precisely to achieve these aims. As a result, to beat it back and not succumb to its seductive harmonies—unfortunately, the world's problems will not be

³⁴ It must be remembered that the GNU license, which applies to a number of free source-code software, is not equivalent to public domain. It is a license, but a license so conceived as to ensure free access across its successive modifications. In that regard, it acts very much like scientific knowledge that must belong to someone, yet can be retrieved and used to nourish further scientific work.

solved by the mere ability to inform, or even to communicate³⁵—it is important to construct a different vocabulary capable of feeding the actions of civil society. That language must foreground societal issues, but doing this alone is not enough; one must also point to some desired contours of this civil society. Stressing the need for infrastructural commons and, perhaps, addressing anew the whole notion of individualism—another point this paper could have addressed but which would have taken us too far afield—are some of the reference points to rebuild a language where something like an information society, if the term is to survive at all, must fit within humane objectives such as those expressed by civil society.

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³⁵ The converse is not true: the lack of communication or information tools can bring about much misery. Absence hurts, but presence does not necessarily help.

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