(Re-)De-commodification in academic knowledge distribution?

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Comments welcome!

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Overview

Abstract

This paper argues that the system of formal scholarly publication is now in its third phase of evolution. This phase has not yet taken full shape, but will – in contrast to phase II which was the age of increasing commodification – be characterised by a strong de-commodified core with only a few niches for commercial publishers. The main reasons for this development are found to be economic, functional and ideational.

1 Introduction

> "A professor of English recently expressed dismay at having to 'unpublish' two of his articles so that he could make them available to his students in a packet of readings without having to pay royalties to his publisher. The professor would happily have waived the royalties due him but found that his publisher would not waive its fees. The professor photocopied his own typescript for his students instead, thereby 'unpublishing' it. 'Truly a postmodern, postlegal experience,' he commented." (Bennett et al. 1992, B1)

The output of research can be regarded from three sides: beyond any doubt, its primary function is being a contribution to scholarship on which future research might be based (if it "connects" well). Second, the output converted into publications plays an important role in the academic career of individual researchers. The so-called "record" often forms the basis of assessments for hiring or tenure. From a final point of view, research output in the form of publications can also be regarded as a commodity. This will be looked at in more depth here.

For sure, there are considerable differences among the disciplines: mainly in the STM (science technology medicine) disciplines, research is often very close to application and hence particularly valuable. But the introductory quote above indicates that also in the humanities publications are regarded as trade objects. A view with unintended consequences.

Many academics do not view their articles as valuable commodities and hence readily assign the copyrights to the publishers. And even when they do so, they agree because they want to get published in the prestigious journals and these are the 'rules of the game' as they developed over the last decades and are widely accepted. The publishers, in turn, gain the right to sell the publications under their own (commercially oriented) terms. This is often in contrast with both the interests of the individual researcher (see the above quote) and of the scientific community at large, in particular the universities which need to devote ever larger shares of their library budgets to buying back their faculty's material previously given to the publishers.

Atkinson (2000, 62) frames the issue in terms of an ideological difference between the main intermediaries in the scholarly information exchange process: libraries and publishers. He argues that "the long-term evolution and nature of information services will depend finally upon the intermediary ideology that ultimately prevails". In his words, the fundamental ideological question is "whether specialized academic information should be understood as a commodity, intended primarily for (and judged in each case by the extent to which it succeeds in generating) revenue – or whether access to scholarly information is a social good that must be freely available." On the one hand, there are a number of scholarly projects and initiatives which go along these lines, but on the other, the commercial academic publishers seem stronger than ever.

This paper is structured as follows: first, I distinguish three phases of scholarly communication (2.) to set the scene for a description of the current developments. I describe the crisis of the current system in phase II (3.) and then systematise the various initiatives changing the status-quo with a view to shape phase III (4.). Against this background, the final section assesses whether the initiatives are doomed or whether we have to expect, in the medium run, either a split system – partly commodified and partly de-commodified – or a uniformly de-commodified one (5.).

2 Three phases of scholarly communication

Seen from the viewpoint of the relationship between scholarly publications and the market, we are able to distinguish three phases of scholarly communication: the original state of greatest possible distance, the system of commodification, and finally, the present partial counter-movement.

The *first* phase is characterised by the advent of the early academic journals in the 17th century which institutionalised and generalised the original system of written scholarly correspondence among individual scholars. The first journals ever were published by Académie Française in Paris and the Royal Society of London for the Promotion of Natural Knowledge in 1665. These publications were still heavily influenced by the previous form of "letters". The important point to note here is that it was scholarly associations (academies and societies) which supported this new system. Scholarly publications were not yet treated as "commodities" but heavily subsidised by the

scholarly institutions. The same holds true for the university presses which started to print scholarly books only shortly after the invention of printing from movable type in the late 15th century. Oxford University Press, for instance, started printing already in 1478. The presses' explicit goal was not primarily to sell books, but to advance scholarship through making the research results available to fellow scholars.

The *second* phase rests on an increasing role of the "market"and so-called trade-publishers since the beginning of the last century. Elsevier Science, for instance, has been in the business for more than 100 years. These new actors proved to be very efficient in turning scholarly output into commodities. For sure, this development took not place at equal speed and similar success in all academic disciplines. In general, however, large parts of academic publishing is in the hands of the private sector today. The noteworthy characteristic of the present situation is the fact that scholarly authors normally give away their to-be-published works for free, or almost free, to the commercial publishers which, in turn, sell their final products back to the universities and their libraries at increasingly high prices. This has led to the so-called "serial crisis" or "journal crisis" (i.e. ever higher prices while library budgets went down, see section 3) with regard to mainly journals in the STM sector, which stretches to other disciplines and the humanities book market in particular.

Consequently, in the late 20th century, it seems that the second is giving way to a *third* phase. It is not clear yet what shape exactly it will take but it features, at least partially, what we might call de-commodification or, with regard to the first phase, re-de-commodification since it might reinstate the original, de-commodified situation. Information and communication technologies (ICT) have brought about new opportunities, in particular electronic publishing in the form of E-journals, E-pre-print servers (self-archiving) and self-publishing.[1] E-publishing potentially improves the economic situation of not-for-profit journal publishers and opens up the possibility that the academic community re-appropriates the publishing business.

While on the one hand, libraries try to pool their resources and purchasing power in consortia and thus stay within the present paradigm, there are, on the other hand,

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[1] This paper is part of a wider research project on the impact of ICT on science and research, carried out at ITA, Vienna <http://www.oeaw.ac.at/ita/cyberscience.htm>.

academics, scholarly associations and libraries setting up free E-print-servers, non-commercial E-journals, free knowledge resources in the WWW, and the like. In other words, a parallel infrastructure seems to emancipate itself from strict commercial considerations facilitating various forms of not-for-profit knowledge circulation. Some of them appear to be similar to those preceding the advent of strong commercial interests in the academic publishing market. Others are quite different from the original system due to the new opportunities provided by current ICT (see below section 4).

3 The crisis of phase II

The crisis in the scholarly publication system (known as the 'serial crisis') "has been well-known for almost two decades" (Whisler et al. 1997, quoting a statement from 1982 already). Increased prices of journals and books lead to cancellations of subscriptions and reduced orders which lead to higher prices because less subscribers pay less while the production costs stay the same which, again, leads to cancellations and so on and so forth (Okerson 1997; Pew Higher Education Roundtable 1998; Frisch 1996, 362 ff.). Another source of this vicious circle is the increased focus of commercial publishers on shareholder value. "(T)he partnership between ... academia and commerce is now breaking down" (Owen 2000, 2). At the same time, library budgets are under pressure. In Germany, the funding of university libraries increased only marginally (nominal 1,3 % from 1991-97), but the prices of journals went up 27 % in the humanities and social sciences and even 77 % in the natural sciences. In the US, the average price of a journal increased by 169 % from 1987 to 1997, three times more than the inflation rate. All libraries organised in the Association of Research Libraries (ARL) had to pay 124 % more for 7 % less journals in 1997. In the same year, Elsevier made a profit of 230 million £ with a turnover of only 571 million £ (Sietmann 1999, 216; cf. also Bär 1999).

Atkinson (2000, 63) formulates the dilemma in terms of agent-client relationships and argues that the "primary clientele of publishers are their owners – often shareholders. When it comes to making decisions between the two, publishers will inevitably, understandably, and justifiably make those decisions that are in the best interest of

their primary clientele." He rightly points at the possibility of a severe aggravation of what we have observed as the traditional serial crisis (which, by the way, has nothing to do with the advent of electronic publishing) through information technology which greatly enhances the control of access to information: "If it is in the primary client's best interest for the publisher to use that control to restrict access to needed information as much as possible, in order to make such information scarce and to drive up its price, then that is exactly what will happen".

Thatcher (1996, 201) speaks of only a partial failure of the market (to provide the services necessary for scholarly communication) since science journals (still?) sell well and do not rely solely on the academic demand. The market fails mainly for non-science. But even in entomology, a rather small biological discipline, "the cost of subscription-financed commercial publication was contributing heavily to the serials crisis" (Walker 1998). Thatcher's differentiation overlooks, however, that both science and non-science books and journals are in crisis: science because of high prices, non-science because of too few sales. There is, however, another danger involved: Whisler / Rosenblatt (1997, 5) describe what they call the "crowding out effect": STM journals would eventually crowd out other, lesser-used journals if their prices increase more than those of other serials and monographs and if library budgets increase less than serial prices go up. At the end of the day, scholars may publish in "write-only journals" (Denning 1996), i.e. journals they do not subscribe, nor do their institutions and libraries.

It is important to note that the crisis is not only a journals crisis, but also a book crisis. In particular in the humanities and some social sciences, the potential readership of specialised books is all but sufficient to sustain their production. Bennett (1994, 244) observes that the "core business of the university press – that of publishing scholarly monographs – is becoming economically impossible while, simultaneously, the presses' core group of authors – faculty – increasingly rely on commercial publishers and on self directed Internet publishing ventures to meet the most pressing needs of scholarly communication."

To sum up, this means that near-comprehensive access to the products of academic knowledge production is no longer guaranteed. The commercial exploitation of academic knowledge by commercial publishers seems, however, to have reached a

watershed. Increasing numbers of academics no longer acquiesce this erosion of the foundations of academic communication.

One arena of the 'battle' is copyright issues. As "the means by which we manage the dual identity of information as a private commodity to be bought and sold and as public good to be freely shared" (Bennett 1996, 187) copyright is a pivotal issue for scholarly communication. Remember the initial quote taken from the same author describing the pains of a university teacher using his own articles as course material. This is no singular case, as we can see from the following quote of the Pew Higher Education Roundtable (1998, 4) manifesto: "The constraints to the flow of scholarly information result not just from prohibitive pricing but from the restrictions that commercial publishers seek to impose on the kind of use an individual faculty member can make of his or her own published work."

This is not the place to go into the details of copyright issues involved here. Suffices to say that the difficulties and problems did not diminish with the advent of E-publishing, quite to the contrary.

4 The developments in phase III

Given, on the one hand, the financial crisis of academic libraries coupled with restrictive copyright management, and, on the other, the new opportunities of E-publishing, various initiatives popped over recent years to change the dissatisfactory situation. A general motto of these initiatives might be: "The free and uninhibited exchange of academic information – efficient and at fair prices – is the pre-condition of all science." (Grötschel et al. 1996, 9) And Rohe (1998, 4) observes "an increasing demand for a non-profit publishing model using the new technology" and submits: "Conditions are ripe for scholars to take control of scholarly publishing."

In this spirit, there are various calls for action and initiatives in the (mainly) US higher education (librarians') scene and beyond (for a good overview on the American scene up to 1997, see Okerson 1997). These initiatives have been sponsored by a variety of organisations, for instance the Andrew W. Mellon foundation (e.g. Cummings et al. 1992) as well as various individual or groups of universities and libraries, e.g. the

CETUS project (CSU-SUNY-CUNY Joint Committee 1997), the Scholar's Forum by the library of Caltech (Buck et al. 1999; on previous Caltech and similar initiatives see Guernsey 1998; Rowen et al. 2000), the Big12Plus Libraries Consortium (1998), the model university policy regarding faculty publication in scientific and technical scholarly journals (TRLN 1993), or the German Commission for purchase of the German Library Institute (Sietmann 1999, 216; cf. also Bär 1999). Very active in the field are the Association of Research Libraries and the Association of American Universities, with e.g. the ARL serial prices project 1989, the Consortium for electronic publishing (CEP), the International Scholars Academic Network (IScAN) 1997, the Electronic Scholarly Publishing (ESP) proposal 1996, the AAU committee on digital networks and intellectual property, the Joint AAU / ARL task forces on intellectual property rights in an electronic environment (AAU Task Forces 1994), and, well known, the Pew Higher Education Roundtable (1998).

To sum up, most of these initiatives mainly aim at *top-down* solutions, i.e. solutions supported by associations and consortia with the aim to replace the present with a de-commodified system. The new system would rest on E-publishing and university or associational publishing as opposed to trade publishing.

4.1 Self-publishing – public self-archiving

In addition to the above top-down solutions, various initiatives exploit the new electronic opportunities *bottom-up*. Self-publishing comes in a variety of forms: individuals setting up download pages, research institutes offering electronic working-paper series, students running low-cost E-journals etc. Franks (1993, part I) calls the individual publishing the "vanity press model" and Ullman (1996) comments: "Today, the amateur has returned to the world of research publication." There are, however, also more organised models of the "new" publishing: E-journals, meta-archives, and E-pre-print archives. Most importantly, there are "faculty and research entrepreneurs" (Thatcher 1996, 202; Bennett 1996, 191) or "trailblazers" (Okerson 1991b, 15) who initiate, develop and often run these free services in favour of the research community.

E-journals

Given the low costs of running an E-journal, it comes as no surprise that this has become a quite common bottom-up route for establishing an alternative self-publishing market for academic publications. Sietmann (1999, 218) even reports of one case of a journal's editors and editorial staff leaving its publisher due to enormous price increases (several 100 %) and successfully founding a new journal, mainly distributed as an E-journal (Evolutionary Ecology Research). Contrasting commercial E-journals which parallel their traditional paper counter-parts, there are many genuine electronic-only series, mostly offered for free or at very moderate fees because they are supported by the enthusiasm of individuals and their affiliations.

Meta archives

Another route are electronic archives which make departmental or associational E-publications (mainly working paper series) centrally accessible and searchable. This helps overcome the intrinsic weakness of the self-publishing model that access to the various electronic sources is unorganised, unfiltered and hence difficult. Such meta archives exist in many disciplines, e.g. in economics (RePEc)[2] or in European integration research (ERPA).

Recently, the Open Archives Initiatives (OAI) succeeded in setting a common standard for the meta-data of papers included in these archives. This is expected to be implemented gradually by many archives. The aim is to make all archives inter-operable world-wide and to promote their establishment by making the necessary software available for free.

E-pre-print servers

A third route is the establishment of discipline-specific electronic pre-print servers. The idea is that papers are "uploaded" individually to a central server before they published in a traditional or E-journal.[3] Many such servers have followed the first well-

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[2] The Internet addresses (URLs) of the various online projects and institutions mentioned can all be found at <http://www.oeaw.ac.at/ita/cyberlinks.htm>, an interactive link database constantly updated.

[3] Bennett observes "that in today's increasingly digital environment, by the time a research paper is ready for publication, it has already been widely read ... The commonplace observation is

known and very busy physics server at Los Alamos (ArXiv), for instance in the cognitive (CogPrint), or biomedical sciences (BioMed Central) or in the philosophy of science (PhilSciArchive). Harnad (n.y.) is sure that ArXiv "is the herald of what will happen in all disciplines sooner or later" (for, e.g., the legal sciences, see Hibbitts 1996a; 1996b).

That the formal exchange of specialised scholarly information "can thrive outside of traditional publishing channels" (Atkinson 2000, 59) has a revolutionary touch since widespread electronic distribution of pre-prints seems bound to destroy high-cost journals (Odlyzko 1994, 45). Perhaps the most prominent advocate of this route is the brain scientist Stevan Harnad with his well-known Subversive Proposal (1993; 1997), extensively discussed in Okerson / O'Donnell (1995). In a later paper, Harnad summarises his proposal – which is already being put in practice in the CogPrint archive – as follows:

> "All authors should continue to entrust their work to the paper journals of their choice. But if, in addition, they were to publicly archive their pre-refereeing pre-prints and then their post-refereeing reprints on-line on their home servers, for free for all, then the de facto practices of the reader community would take care of the rest...; library serial cancellations, the collapse of the paper cardhouse, publisher perestroika, and a free for all, e-only serial corpus financed by author-end page charges would soon follow suit." (Harnad 1998, 128)

As pointed out by many, the system of public E-pre-print archiving could easily be combined with a journal system in the sense that the archives are for registering priority claims and making information available as quickly as possible, while the new journal system would consist of refereeing and certifying. Taubes (1996, 768) refers to the idea that submitting to the journal would then only mean that the author submits the reference number of the manuscript in the archives. The journal could then "freeze the article" by changing the password disallowing the author to change that manuscript with a view to assuring that a paper that has been accepted for publication is indeed the same one readers have been downloading (for another version of this idea, see the "Designated Channel" of Atkinson 2000, 67, below section 4.4). A less far-reaching proposal would redefine the copyright transfer to publishers: "When the

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that published journals are now little more than the archives of science, while most of the vital work of scholarly communication is carried elsewhere. Of course there is much variation from discipline to discipline in this disassociation of validation from conventional publication." Bennett 1996

author and the university agreed to give the copyright to the publisher, they would explicitly give non-profit organizations [like universities and libraries] the right to copy the articles in response to specific requests for them. Faculty members would not transfer the copyrights of articles .. to any publisher unwilling to accept that condition." (Bennett et al. 1992)

The "Subversive Proposal" and similar ideas are, of course, very much disputed. For instance, Harnad proposes author-end page charges to finance the system (e.g. Harnad 1997, 6; similar Walker 1998). Tomlins (1998, 147) notes that this "reproduces what has long been traditional practice in the humanities, a model as now beset by precisely those pressures that he thinks it can subvert". Note also the extensive debate between Harnad and Varian in (Harnad et al. 2000), followed up in much "skywriting" (to use Harnad's own term) in electronic forums like the September98Forum on these issues or the current online debate in "Nature". There is certainly no space to list all the arguments in this debate. Although both agree in principle that online self-archiving is a way to solve the current crisis, they disagree on the reasoning why this is so.

One strand of opposition to the self-publishing models focuses on the cost issue, arguing that the costs of publication are not only eliminated, but only shifted, often hidden in other university budgets and perhaps even increasing overall "as it is unlikely actually that the work will be done either as well or as cheaply as it would be by professional-publishing people ... But what is worse is that people who would otherwise be doing research and teaching, or who would otherwise be support staff enabling those crucial activities, are now engaged in the work of publishing to the detriment of the time available for teaching and research." (Day 1998, 2) While there is certainly some truth in this observation, it is not really an argument against self-publishing since, already now, most what is necessary to publish, has to be done by the scholars themselves (see below 5).

To sum up, E- print servers have the potential either to replace the traditional scholarly publication system altogether or to organise the pre-refereeing phase very differently. In the latter case, quality control would still be entrusted in the journal system, while in the former case, this would be incorporated. Their main advantages over the phase II system is their universal accessibility, speed and low cost. How such systems would be

financed, is still an open question, but it seems that the relatively low costs could be borne by the professional associations.

4.2 Central, comprehensive digital archives and Open Source

While the E-pre-print archives only include pre-prints and the meta archives mainly departmental working papers, a number of initiatives go one step further (respectively take another route) aiming at archives comprehending not only "grey", but also published literature. The most prominent examples of this are PubMed Central for the life sciences managed by the US National Library of Medicine (NLM). A famous new initiative by a number of scientists, including Nobel laureates (Roberts et al. 2001) aims to create "public, electronic archives of the scientific literature, containing complete copies of all published scientific papers".

In the beginning, at least, the commercial publishers of STM literature are quite reluctant to give free access to their products via such services. Therefore only a few journals are already available through PubMed Central. The number is steadily growing, but some think archives such as these will never cover an area completely because of the financial interests involved.

Open Source

Phase III de-commodification is not only driven by primarily economic reasons, but also inspired by another movement which roots in software development. Raymond (1999), for instance, describes the 'bazaar method' of managing large software projects according to the open source model. It rests on collaboration over the Internet while the source code remains in the public domain and cannot, in principle, be sold. "Science, after all, is ultimately an Open Source enterprise." (DiBona et al. 1999, 1) DiBona et al. argue that the sources have to be shared: the hypothesis, the test conditions, and the results. "Scientific knowledge is often in the public domain; it is one function of academic publishing to put it there." (ibid., 2) "The open sharing of scientific results facilitates discovery ... minimizes duplication of effort..." (ibid., 4) These authors argue that programming according to the open source model shares an emphasis on reputation with science: "Scientists aren't supposed to hoard profits from

their inventions, they are supposed to publish and share their inventions for all to benefit from." (ibid. , 7)

Although much of the academic enterprise is not profit-oriented, some is. For the not-for-profit sectors, the open source model may be a model for the future. There are already projects like OpenBook, OpenTheory and the like. The Open eBook Consortium tries to promote an open standard for e-books to avoid the present splitting due to commercial considerations (Adobe PDF, Microsoft Reader etc.). In its OpenCourseWare project, MIT plans to make all teaching material available over the Internet free of charge (for a critical assessment see Hartmann 2001).

Gräbe (1998) brings in another aspect: if scholarly publishing moves to the electronic world, then the software and the standards of knowledge representation become an important issue. He warns that it may well happen that academia will not be able to pay for accessing the digital knowledge units, if the software were not open-source-like or if the rights are not kept within the academic realm.

4.3 A new role of university presses and academic libraries

> "We are a not-for-profit organisation, but also a not-for-loss organisation." (Martin Blume, editor in chief of the American Physical Society, interviewed by Albrecht 2001)

The crisis described above might not only be solved via self-publishing as described above (4.2), but also by those academic institutions which are traditionally in the business of publishing and archiving, namely university presses and libraries. Three reasons can be listed:

First, while (groups of individual) scholars engaging in the business of self-publishing in whatever form are tackling something relatively new for them, the presses are professionals and might be at the core of cyberscience publishing because "(t)he geniuses of this new technology have created the new vocabulary ... but their brainchild lacks depth. It is a thousand miles broad but only a quarter-inch deep, and we can offer depth." (Zeigler 1997, 42) Thatcher suggests an important role for university presses instead of amateurish "faculty and research entrepreneurs" doing it

themselves. He argues that presses have valuable and cheap skills to offer and that the time of academics is often treated as a free good, but it is not (1996, 202). Presses' special skills are not only in the technical domain, but in organising the certification and filtering of scholarship (which remains the realm of academics).

Second, the financial crisis is an incentive. As Okerson (1991a, 3) notes, it is hardly surprising that a vision of university-based publishing captures the imagination of parts of academe since "(a)bout 90% of formal academic publications migrate outside the academy before returning home as repurchased monographs and serials." Thatcher demonstrates that the disassociation of supply and demand, i.e. the insufficient demand for scholarly publications in the marketplace, was "the very basis of the rationale for university-based publishing in the first place, not a new phenomenon just affecting us today"(1996, 200). Most university presses, however, publish principally in the humanities (Walker 1995, 38). Consequently, if the presses should play a more prominent or even dominant role in academic publishing, they would also need to capture the science market.

Third, there is a necessity of academic institutions to become (again) publishers themselves in many areas since they could not find a commercial partner, e.g. for the publication of scientific software, databases and the like (Grötschel et al. 1996). Hence, it is not only financial reasons which make academics and their institution initiate moves away from commercial publishers, but also the (perceived) impossibility to market particular categories of academic results (because there is no market, because the costs are too high etc.). In this respect, E-publishing might offer "many new opportunities for university presses [because] (u)niversities have human and computing resources that would offset the factor of market dominance to some degree" (Walker 1995, 40).

Like the self-publishing route discussed under the previous heading, also a potential central role of the university presses in phase III could lead to a nearly de-commodified system of scholarly exchange. Chodorow (1998, 7 s.) argues that there are three possible ways to solve the serial crisis: consortial purchase and licensing of information resources; the consideration of a new pricing system for information; and the exploration of schemes to change the information market itself. Only the third way is, in his view, promising: "... the creation of a new market for scholarly information that

preserves the low prices necessary to the successful maintenance of the modern academic enterprise. The new market would be separate from the 'edutainment' market now developing, and would remove the middlemen – the commercial publishers – from the academic market. Those features would enable scholars and universities to distribute information among themselves in a system affected by costs instead of profits." Whisler / Rosenblatt suggest a scenario for universities in which they themselves would invest capital resources more heavily in university-based information flows and new forms of scholarly publication as well as place increased market pressures on the commercial sector. They argue that if universities "were to make strategic capital and staffing investments in university presses during the short term, the presses could be more likely to make a successful and rapid transition to electronic publication" (1997, 22). At the same time, intensive university efforts (i.e. investments) to recover STM and business publishing from the private sector should be made to reduce the crowding out of university press publications by for profit publishers which could also be accompanied by libraries' placing strong market pressures on commercial publishers through cancellation of journals whose prices rise faster than the average rates for scholarly journals in general. "The investments ... could be recovered over time through reductions in capital investments in library buildings. Ultimately, the university itself would encompass most of the information flow in scholarly communication through its networked capability. That information having commodity value outside of the academy could be sold in the marketplace, and the revenues used as a subsidy to the system itself." (ibid., 22)

There is, however, still a long way to go since "(m)any universities have committed a major error in trying to force their university presses to become self-supporting. This policy has resulted in the presses identifying increasingly with – and adopting the values of – commercial publishers." (Atkinson 1996, 261) Bennett / Matheson (1992) envisage that universities might funnel more money into the university presses if the money now spent in their libraries could be redirected to university-published journals. As Okerson reported, this train has been set in motion already at the beginning of the last decade: "In the US in 1991, university-based publishing is receiving significant attention as well as tremendous re-vitalization from the university-linked networks. ... The mechanisms are almost in place; the community is energetic and eager; the need is urgent." (1991a, 6)

Given their quandary between trade publishers and demanding faculty, academic libraries are among the most active promoters of phase III. Apart from their activist agenda-setting role, libraries contribute two things: first, they can co-operate among themselves to gain greater market power vis-à-vis the commercial publishers, and second, they may themselves enter the domain of publishing. See for instance the Scholarly publishing and academic resource coalition (SPARC), High Wire Press and Cooperative Online Resource Catalog (CORC) initiatives (Owen 2000, 3). Libraries have also a traditional role to play with regard to providing access to the published material. "However, the job of organizing, coding, linking, updating, licensing, and maintaining that wide range of material takes on new significance." (Wittenberg 1998, 2) The example given is CIAO, a repository and resource portal for researchers in the field of international affairs research.

4.4 A new role for academic associations

Many argue that it should be the primary task of academic associations to organise the de-commodified phase III scholarly communication system. Some of the initiatives have been mentioned already in section 4.1 when discussing the electronic archives or pre-print servers; here we shall add some more proposals and initiatives directly engaging the professional associations.

For instance, Getz proposes that a scholarly association "might ally itself with one of these [working-paper] sites, give the service an official status, and invest in the features ... to make it more robust and useful. Although freebie ... services are useful, an enhanced ... service for a fee (or as part of membership) might be much better." (Getz 1997, 9) If professional bodies and associations will again become more actively involved in publishing, the flow of information might be more directly and quickly delivered form host institution to requester, author or researcher. (Johnston 1998, 12) A non-commercial system of refereed scholarly communication can be combined with peer review. Morton favours a centralised system on the shoulders of scholarly associations who would sponsors a 'super site' which would provide "sanctioned stature – a surety that only bona fide scholarly work would be resident" (1997, 4). He proposes that copyright remained with the author or the employing institution. "In this

model the process of communication predominates over the issues of product and ownership embodied in the present commercial model" (ibid., 5).

As to financing such systems, Walker (1998) proposes a scheme of charges paid by the authors for re-prints in a society's journal whereby part of the revenue would finance eventually putting all papers online for free access by users. Morton (1997, 4) proposes "annual institutional site-gateway fees" to be based on the institutional budget or on the number of researchers who potentially could place publications at the site. Ginsparg (1996, 7) envisages for research communities "comprised of a relatively small number of authors and a much larger number of readers" a model "wherein the institutions that support the research assert copyright privilege, assume the role of publishers, and disseminate material produced in-house for a fee to those institutions that only consume it." He argues that "(t)hough this would upset proponents of free electronic access to all publicly supported research material, it would at least be a logical system, in which the real risk-takers – namely the institutions that support research by way of investment in salary and equipment – are able to profit from and protect the products of that investment."

Another important issue here is quality control. The associations pool all resources necessary to secure quality in phase III. As Atkinson puts it: "It should be the function of academic information services to ensure that national – or preferably international – peer review structures are in place." (1993, 210) There are various models being proposed, some of them involving the co-operation with traditional journal structures, be they run by commercial publishers or not, others setting in place completely new structures. For instance, Atkinson (2000, 60 s.) sees "an unprecedented opportunity to reconfigure information services" and argues that "the academy needs to use disintermediation as a tool to reappropriate responsibility for formal scholarly communication that in the past has been the exclusive domain of scholarly publishers." His own proposal is called "The Designated Channel" for each discipline. All scholarly work would go into this channel, peer review will certify. This means that "the item does indeed add substantial knowledge" and that the academy will guarantee its access over time. There will be "normative meta data" informing about currently perceived importance of an item in the database and will be indexed based on controlled vocabulary. Use-tracking, i.e. access data, will add further information about the quality. The library's task would be to create a synopsis, stipulating what is new or

unique in the publication which should add up to cumulative meta data forming a sort of encyclopaedia. Politically, these channels would separate information access from the institutions. The bibliographic value is “one-stop shopping”, e.g. on the basis of the OAI standard. Atkinson’s proposal is based on his earlier thoughts about a “control zone” into which all scholarly important material would go: “a single, virtual, distributed, international digital library, a library that has (conceptual, virtual) boundaries, that defines its service operationally on the basis of the opposition between what is inside and outside those boundaries, and that bases that service on the traditional social ethic that has motivated all library operations in modern times. The academic community must consider, in other words, the creation of a control zone ... understood as something that is technically and conceptually separate from the open zone.” (1996, 254 s.)

5 De-commodification?

Phase III is, so far, a time of change with a final state not yet clearly visible. This last section of the paper argues that we have to expect a mixed system, partly commodified, partly de-commodified. Although the big hopes of a complete new scholarly publication system are not yet fulfilled, I hold that in the medium run, BioMed Central, ArXiv and the like will have taken over in most disciplines. My main argument is that, with the help of ICT, the core business of academic publishing, in the sense of formal scholarly communication, can be done without professional publishers.

The case for de-commodification

This argument rests on the answer to the following question: What does publishing involve and who can render the services? If it turns out that the traditional system is not adding evident value and is neither in a significantly better position, and if, at the same time, the alternative system is much cheaper, I have no doubt that the latter will ultimately replace the former.

If we look at the various functions to be performed, we can distinguish between four groups: First, those tasks which, already in phase II, are done by the scholarly community as a whole anyway. This includes *editing*, i.e. “running” the journal which

includes managing editorial rules and the correspondence with authors, referees etc., is always done by an academic anyway (now increasingly via E-mail, see Appel 1996); *scholarly quality control*, i.e. finding out whether the submitted article is new, valuable etc., is also done by academics.[4] *Reputation* is certainly a service provided by publishers, as Rohe (1998, 2) argues: "A well-known publisher's name is similar to a brand name." Atkinson puts it like this: "We do not really pay for *what* is in [the publishers] publications; what we pay for is rather *that* what is in their publications acquires a certain status and attracts a certain attention by virtue of its location in those publications." (2000, 64, emph. in orig.) In any case, scholarly associations or universities could be, as they are already in some areas, the new brand names for scholarly publications. There is no need for commercial brands which are mainly targeted at increasing revenues, less at increasing reputation for scholars.

The second group of functions is increasingly being performed by the author, not by the publisher. For instance, "*typesetting"/formatting/page-composition/layout/tagging*, including the HTML or, later on, XML coding, is done to an ever increasing degree by the author with the help of auto-formatting editor software, too.[5] As to *proof-reading*, there will be no differences to the status quo: the author him- or herself is proof-reading.

A third group of tasks in academic publishing are typically outsourced. These can as well be done by phase II non-profit publishers, such as university presses and / or the

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[4] Owen, however, suggest that peer review will be outsourced to the publishers under the responsibility of the academic community Owen 2000. What exactly do publishers in this respect? Strong Strong 1995 believes, first, that "what publishers do will become increasingly important as time goes by. ... Good publishers, by screening this information for quality, and validating it during the publishing process, perform an enormous service." Second, he argues, "the digital age can be the age of disinformation. ... So what a publisher can offer is a reliable source for the real thing". Harnad challenges the claim that publishers deliver quality control by distinguishing between "quality of form" and "quality of content". The former indeed being delivered by publishers, the latter has always been done by the scholars themselves Harnad 1993. Peters argues that "the publisher's role is far more profound than mere typesetting and printing. It is both the organization (administration and management) and authorization (through peer review) of the process" Peters 1996. It remains however unclear why peer review should be a publisher's task since, in practice, it is all done by scholars, even the co-ordination of referees is done by members of the academic community, i.e. the editors.

[5] Fisher notes that in an early, but MIT Press run E-journal the managing editor also did the tagging and "typesetting" Fisher 1997; the same is true for many other E-journals and E-series.

university or research institutions itself. This includes *language editing* which, in most cases, is already done by the scholars themselves; *copyediting*, i.e. the part of quality control which relates to formal necessities, such as a complete and coherent bibliography, etc., is either included in the typesetting / tagging or still outsourced as done now with most books. Furthermore, ever more sophisticated software is spreading among researchers and doing much of the job of a copyeditor in advance and automatically. For instance, new bibliographic software makes sure that the reference list is accurate and comprehensive as well as in the desired format.

A last set of tasks will be increasingly handed over to specialised software could be simply or nearly superfluous in phase III. For instance *linking*, i.e. fitting the articles into a web of knowledge, making them retrievable etc. could be done by the publishers (Hunter 1998, 2). However, there are already first examples of linking tools which do the job automatically on the basis of input by authors and editors. *Printing* will be done locally, by the reader or the library. *Distribution* is, in the E-world, done via the Internet. No packaging, shipping etc. is necessary. Financial transactions, if at all necessary, are being automated. *Marketing* is trickier, but how much marketing is actually done by scientific publishers? Is it not mainly the authors who promote their books in conferences, by referencing in journal articles, refereeing books for journals, etc.? In an E-world, marketing could be turned into an information service, eventually via centralised access points with E-mail subscription services and / or accessible by knowbots (personalised knowledge robots). MacKie-Mason / Riveros (1997, 2) may be right to claim that "(g)ood scholars are good at research, not at finding readers" but we argue that finding readers would be organised in a more refined and probably more efficient way. Furthermore, *copyright management*, would be almost superfluous in a de-commodified scholarly world. Fisher (1993), for instance, opposes the present copyright management system to two alternative systems which he calls 'author-managed', i.e. one where the authors retain their copyrights and consequently have to handle all related business and 'institution-managed' where the authors' institutions (university presses) do the job. Fisher argues that, if a journal's policy was to permit any and all photocopying, the prices would go up enormously and the subscription rates down to one per journal. Furthermore, 'secondary publishers' (indexing services etc.) will have the costly burden to have individual relationships with each author or institution instead of a few publishers which would turn their business to expensive. If

the purpose of copyrights would not be to protect commercial interests of either authors nor publishers, but solely to protect authors from intellectual theft, then authors could retain their copyright and everybody could make copies (electronic or print) for free as long as not abusing the content.

Looking at this list of arguments, the result is that there is no particular need for commercial publishers in the system of scholarly communication.[6] This view is, however, not undisputed. The main counter-argument is that authors are not in the best position to take over the publishing business (e.g. MacKie-Mason et al. 1997, 2) (Walker 1995, 39; Jensen 1998, 3; Rowland 1994; Day 1998, 2). But as already mentioned, universities or scholarly associations could easily invest in hiring professionals and still save money in phase III.

Most authors, therefore, sustain that the phase II system will be replaced by a new set up. With regard to the book market, for instance, Mueller argues that already by now, the decision of whether or not to publish no longer depends on the prognosis of the number of sold copies. “In such an environment, the publisher has a reputation to protect, but incurs no particular costs: editorial costs are pushed to the author, the cost of approval by peer review is borne collectively by institutions, production and distribution costs are not incurred until an actual sale, and advertising and marketing can be ignored: the global niche of scholars who do [a particular speciality] can be expected to spread the word among themselves.” (2000, 4) Many leading scholars are convinced that “(e)ither a collaborative solution will be reached, with paper publishers retooling themselves to perform those of their services that will still be required in purely electronic publishing, or scholars will simply bolt, and create their own purely electronic publishing systems.” (Harnad 1993, 4; see also Atkinson 1993, 210; Hibbitts 1996b, 2.16 s.)

Niches for sustained commodification?

Even in case most of the academic papers would be accessible for free via the Internet, commercial journals could play a role. With other journal editors Bloom, for instance,

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[6] In the words of Okerson: “Crudely put, it seems that the publisher is superfluous.” Okerson and O'Donnell 1995.

argues that “quality information worthy of appreciation requires more effort than most scientists could muster, even if able.” (1998)

One possibility is that they would specialise in completely new services, such as providing added value in comparison to the web databases. The reason for buying and reading journals would be less that they contain original papers but rather that the editorial board provide the readers with analysis by putting new papers in context: editorials and comments sorting of information may become the hearth of a journal (Graetzel von Graetz 2000). Delamothe (2001) goes even one step further by suggesting that if “journals cannot add value then they will die, which is right and proper. But if reading them can be a pleasure not a chore then they can survive.” He argues that their value will be “around selecting research that is important to their audiences and presenting it in as exciting and as relevant a way as possible; digesting and synthesising research, beginning to turn it from information to knowledge; educating readers, particularly on subjects that are new to them but which will change their lives; setting the agenda and encouraging debate within the community; prompting unfamiliar but deep thoughts; and ... entertaining the customer.” This last point, popularising academic output, could be particularly attractive to commercial publishers, and is traditionally put aside by academics.

Another area for continued commercial involvement in scholarly publication is the production of E-monographs. Easier access, visual processing, enhanced intellectual content, electronic linking, provision of moving images etc. are all laborious tasks which require special skills and time and might hence be provided by publishers. The same is true for multimedia publications (Odlyzko 1994, 46; similar Götze 1996, 70)

Atkinson argues that “intermediaries will provide some services for writers and readers in online circumstances that writers and readers now provide for themselves in the traditional environment” because online information exchange “enhances but also necessarily complicates the exchange process” (2000, 60). There will be more, but different intermediation which he calls ‘hyperintermediation’. In my view, this task is, however, more likely to be fulfilled by the libraries than by publishers.

Conclusions: phase III in the making

Phase III of the evolution of the system of formal scholarly publication has not yet taken full shape, but will – in contrast to phase II which was the age of increasing commodification – most likely be characterised by a strong de-commodified core with only a few niches for commercial publishers. The core will most probably be an association-based system of E-pre-print publishing with subsequent quality control.

In this paper we have mainly focussed on functional reasons for this development, both economic – the system crisis of phase II – and technical – the new opportunities of the ICT which have already taken over many of the functions performed by the private sector. In addition, we have presented ideational developments which herald phase III – the growing conviction that almost free access to scholarly work on the Internet is a good idea, and the open source perspective which could slowly develop normative power and de-legitimise phase II arrangements.

Important additions to such a lens are, for sure, institutionalist and constructivist concerns. Issues of path-dependency and sunk costs should not be underestimated. Commercial publishers as well-established actors of phase II should not simply be expected to vanish. As Atkinson points out, re-appropriation requires "deep-seated cultural adjustments within the academy" (2000, 64) and even institutional competition could be a significant impediment. However, there are already new institutions and new ways of doing beyond for-profit publishing, hence stability seems challenged and new pathways on offer. Therefore, the functionalist and ideational lenses are not the only ones suggesting significant change in the system of scholarly publication.

With Bennett (1996, 192 s.) and Van Reenen (1998) we may expect that activist behaviour of both academics and librarians will continue to play a crucial role with a view to change the tide in the market for scholarly publications. Already more than a decade ago, the various initiatives outlined here have started. Many of the initiatives have already proofed highly successful and serve as models for ever more research areas. Although some of the features of the de-commodified system could be labelled 'revolutionary', the transition to phase III is evolutionary. It is this trial-and-error and step-by-step approach which suggests that a new and strong system of academic knowledge distribution is in the making.

References

AAU Task Forces, 1994, *Acquisition and Distribution of Foreign Language and Area Studies Materials; A National Strategy for Managing Scientific and Technological Information; Intellectual Property Rights in an Electronic Environment*; report, commissioned by: Association of American Universities, Association of Research Libraries, May, Washington: ARL <http://www.arl.org/aau/frontmatter.html>.

Albrecht, J., 2001, Das Netz für freie Forschung, *Die Zeit*, 19, 3.5.2001, 44.

Appel, A. W., 1996, How to Edit a Journal by E-mail, *Journal of Scholarly Publishing 27(2)*, 82-99.

Atkinson, R., 1993, Networks, hypertext, and academic information services: some longer-range implications, *College & Research Libraries 54(3)*, 199-215.

Atkinson, R., 1996, Library Functions, Scholarly Communication, and the Foundation of the Digital Library: Laying Claim to the Control Zone, *The Library Quarterly 66(3)*, 239-265.

Atkinson, R., 2000, A rationale for the redesign of scholarly information exchange, *Library Resources and Technical Services 44(2)*, 59-69.

Bär, S., 1999, Das große Würgen, *Laborjournal (4)* <http://www.biotech-europe.de/rubric/editorials/verlage.html>.

Bennett, S., 1994, Repositioning University Presses in Scholarly Communication, *Journal of Scholarly Publishing 25(July)*, 243-248.

Bennett, S., 1996, Re-engineering Scholarly communication: Thoughts Addressed to Authors, *Journal of Scholarly Publishing 27(July)*, 185-196.

Bennett, S., Matheson, N., 1992, Scholarly Articles: Valuable Commodities for Universities, *Chronicle of Higher Education*, 27 May 1992, B1-B3.

Big12Plus Libraries Consortium, 1998, *Scholarly Communication and the Need for Collective Action: A Statement by the Chief Academic Officers of the Big 12*; Last update: 7 August 1998 [Accessed on: 01-16 2001] <http://www.big12plus.org/pressreleases/scholar.htm>.

Bloom, F. E., 1998, The Rightness of Copyright, *Science 281(5382)*, 1459-1460 <http://www.sciencemag.org/cgi/content/summary/281/5382/1451>.

Buck, A. M., Flagan, R. C., Coles, B., 1999, *Scholars' Forum: A New Model For Scholarly Communication*; Last update: March 23, 1999 [Accessed on: 01-16 2001] <http://library.caltech.edu/publications/scholarsforum/>.

Chodorow, S., 1998, The Faculty, the University, and Intellectual Property, *Journal of Electronic Publishing 3(3)* <http://www.press.umich.edu/jep/03-03/chodorow.html>.

CSU-SUNY-CUNY Joint Committee, 1997, *The Academic Library in the Information Age: Changing Roles*, commissioned by: Consortium for Educational Technology for University Systems CETUS <http://www.cetus.org/acad_lib.pdf>.

Cummings, A. M., Witte, M. L., Bowen, W. G., et al., 1992, *University Libraries and Scholarly Communication*; report, commissioned by: The Andrew W. Mellon Foundation Association of Research Libraries <http://www.lib.virginia.edu/mellon/mellon.html>.

Day, C., 1998, Digital Alternatives: Solving the Problem or Shifting the Costs?, *Journal of Electronic Publishing 4(1)* <http://www.press.umich.edu/jep/04-01/day.html>.

Delamothe, T., Smith, R., 2001, PubMed Central: creating an Aladdin's cave of ideas, *British Medical Journal online (322)*, 1-2 <http://www.bmj.com/cgi/content/full/322/7277/1>.

Denning, P. J., 1996, Journals' End? or Electronic publishing Plan a Must, *Computing Research News (September)* <http://www.acm.org/pubs/JournalsEnd.html>.

DiBona, C., Ockman, S., Stone, M., 1999, Introduction, in: DiBona, C., Ockman, S., Stone, M. (Eds): *Open Soruces: Voices from the Open Source Revolution*, Cambridge et al.: O'Reilly <http://www.oreilly.com/catalog/opensources/book/intro.html>.

Fisher, J. H., 1993, Copyright: The Glue of the System, *Journal of Electronic Publishing 1(15)* <http://www.press.umich.edu/jep/works/fisher.copyright.html>.

Fisher, J. H., 1997, Comparing Electronic Journals to Print Journals: Are There Savings?, *Andrew W. Mellon Foundation Conference "Scholarly Communication and Technology*, 1997-04-24/25, Emory Univ. <http://www.arl.org/scomm/scat/fisher.html>.

Franks, J., 1993, *What is an Electronic Journal? (Message to the Public-Access Computer Systems Forum <PACS-L> in four parts)*; Last update: January 1993 <http://listserv.uh.edu/cgi-bin/wa?A2=ind9301c&L=pacs-l&P=5953, 6067, 6181, 6295>.

Frisch, E., 1996, Elektronische Fachzeitschriften im WWW als Paradigmenwechsel im System wissenschafltichen Publizierens, in: Krause, J., Herfurth, M., Marx, J. (Eds): *Herausforderungen an die Informationswirtschaft. Informationsverdichtung, Informationsbewertung und Datenvisualisierung. Proceedings des 5. Internationalen Symposiums für Informationswissenschaft (ISI'96), Humboldt-Universität zu Berlin, 17.-19. Oktober 1996*, Konstanz: UVK-Universitätsverlag, 361-374

Getz, M., 1997, Electronic Publishing in Academia: An Economic Perspective, *Andrew W. Mellon Foundation Conference "Scholarly Communication and Technology*, 1997-04-24/25, Emory Univ. <http://www.arl.org/scomm/scat/getz.html>.

Ginsparg, P., 1996, Winners and Losers in the Global Research Village, *UNESCO conference, session Scientist's View of Electronic Publishing and Issues Raised*, 19-23 Feb 1996, Paris <http://xxx.lanl.gov/blurb/pg96unesco.html>.

Götze, D., 1996, Die Rolle des Verlags, in: Börsenverein des Deutschen Buchhandels e.V. (Ed.): *Die unendliche Bibliothek: digitale Information in Wissenschaft, Verlag und Bibliothek*, Wiesbaden: Harrassowitz, 68-72

Gräbe, H.-G., 1998, Wissenschaft zwischen Freizügigkeit und Kommerz (erweiterte Version), *Machtfrage der Informationsgesellschaft*, 1998-06-12/13, Frankfurt am Main <http://www.informatik.uni-leipzig.de/~graebe/projekte/infopapers/ffm.html>.

Graetzel von Graetz, P., 2000, Ein Paradigmenwechsel in der Wissenschaftspublizistik, *Telepolis*, 27.1.2000, 2000-01-27 <http://www.heise.de/tp/deutsch/inhalt/co/5726/1.html>.

Grötschel, M., Lügger, J., 1996, Neue Produkte für die digitale Bibliothek: die Rolle der Wissenschaften, in: Börsenverein des Deutschen Buchhandels e.V. (Ed.): *Die unendliche Bibliothek. Digitale Information in Wissenschaft, Verlag und Bibliothek*, Wiesbaden: Harrassowitz, 38-67 <http://elib.zib.de:888/math.org.softinf.pub.produkte>.

Guernsey, L., 1998, A Provost Challenges His Faculty to Keep Copyright on Journal Articles, *The Chronicle of Higher Education*, 1998-09-18 <http://www.chronicle.com/free/v45/i04/04a02901.htm>.

Harnad, S., 1993, Implementing Peer Review on the Net: Scientific Quality Control in Scholarly Electronic Journals, *International Conference on Refereed Electronic Journals: Towards a Consortium for Networked Publications. Implementing Peer Review on the Net: Scientific Quality Control in Scholarly Electronic Journals*, 1993-10-01/02, Univ. of Manitoba,

Winnipeg
<http://cogsci.soton.ac.uk/~harnad/Papers/Harnad/harnad96.peer.review.html>.

Harnad, S., 1997, Learned Inquiry and the Net: The Role of Peer Review, Peer Commentary and Copyright, *Antiquity (71)*, 1042-1048
<ftp://ftp.princeton.edu/pub/harnad/Harnad/HTML/harnad97.antiquity.html>.

Harnad, S., 1998, On-line journals and financial fire walls, *Nature 395(9)*, 127-128
<http://www.nature.com/cgi-taf/DynaFixer.taf?rqid=/395127A0.frameset>.

Harnad, S., n.y., *Copyright F.A.Q. (CogPrint Archive)*; Last update: no date given [Accessed on: 15.2. 2001] <http://cogprints.soton.ac.uk/copyright.html>.

Harnad, S., Varian, H., Parks, B., 2000, Academic publishing in the online era what will be for-fee and what will be for-free?, *Culture Machine (2)*
<http://culturemachine.tees.ac.uk/Cmach/Backissues/j002/Articles/art_harn.htm>.

Hartmann, F., 2001, Akademische OpenCulture oder globales WissensBusiness, *Telepolis*, 10.5.2001 <http://www.heise.de/tp/deutsch/inhalt/co/7593/1.html>.

Hibbitts, B. J., 1996a, Last Writes? Reassessing the Law Review in the Age of Cyberspace, *New York University Law Review 71(June)*, 615-688
<http://www.law.pitt.edu/hibbitts/lastrev.htm>.

Hibbitts, B. J., 1996b, Yesterday Once More: Skeptics, Scribes and the Demise of Law Reviews, *Akron Law Review 30*, 267 <http://www.law.pitt.edu/hibbitts/akron.htm>.

Hunter, K., 1998, Adding Value by Adding Links, *Journal of Electronic Publishing 3(3)*
<http://www.press.umich.edu/jep/03-03/hunter.html>.

Jensen, M., 1998, Cost Recovery and Destiny: Developing the Appropriateness Matrix, *Journal of Electronic Publishing 4(1)* <http://www.press.umich.edu/jep/04-01/jensen.html>.

Johnston, C., 1998, Electronic technology and its impact on libraries, *Journal of Librarianship and Information Science 30(1)*, 7-24.

MacKie-Mason, J. K., Riveros, J. F., 1997, Economics and Electronic Access to Scholarly Information, *Internet Publishing and Beyond: Economics of Digital Information and Intellectual Property*, 1997-01-23/25, Cambridge, MA
<http://ksgwww.harvard.edu/iip/econ/mason.html>.

Morton, B., 1997, Is the Journal as We Know It an Article of Faith? An Open Letter to the Faculty, *The Public-Access Computer Systems Review 8(2)*
<http://info.lib.uh.edu/pr/v8/n2/mort8n2.html>.

Mueller, M., 2000, *The library catalog, the word processor, and the digital archive: Three stages of information technology in humanities scholarship* [Accessed on: 10-23 2000] <http://faculty-web.at.nwu.edu/english/mmueller/ariadne/bibliography/threestagesframe.htm>.

Odlyzko, A. M., 1994, Tragic Loss or Good Riddance? The Impending Demise of Traditional Scholarly Journals, *Journal of Universal Computer Science 0(0)*, 71-122 (quoted according to manuscript) <http://www.jucs.org/jucs_0_0/tragic_loss_or_good>.

Okerson, A., 1991a, Back to Academia? The Case for American Universities to Publish Their Own Research, *Logos 2(2)*, 106-112
<http://www.library.yale.edu/~okerson/case.html>.

Okerson, A., 1991b, The Electronic Journal: What, Whence, and When? [Paper delivered at the OCLC Users Council Annual Meeting in Februrary 1991], *The Public-Access Computer Systems Review 2(1)*, 5-24 <http://www.library.yale.edu/~okerson/pacs.html>.

Okerson, A. S., 1997, Midnight in the Garden of Good and Evil? Libraries, Academic Publishing, Copyright, and other Miasmas, <http://www.library.yale.edu/~okerson/okerson-sf.html>.

Okerson, A. S., O'Donnell, J. J. (Eds), 1995, *Scholarly Journals at the Crossroads: A Subversive proposal for Electronic Publihsing*: Association of Research Libraries <http://www.library.yale.edu/~okerson/subversive.html>.

Owen, J. M., 2000, The New Dissemination of Knowledge: Digital Libraries and Institutional Roles in Scientific Publishing, *Workshop "The Economics of Scientific Publication" of the Erasmus Institute for Philosophy and Economics*, April 19, 2000, Rotterdam <http://www.eur.nl/fw/philecon/WESP-jmo.PDF>.

Peters, J., 1996, The Hundred Years War Started Today: An exploration of electronic peer review, *Journal of Electronic Publishing 1(6)* <http://www.press.umich.edu/jep/works/PeterHundr.html>.

Pew Higher Education Roundtable, 1998, To Publish and Perish, *Policy Perspectives 7(4)* <http://www.arl.org/scomm/pew/pewrept.html>.

Raymond, E., 1999, Die Kathedrale und der Basar, *Linux-Magazin*, 132-145.

Roberts, R. J., Varmus, H. E., Ashburner, M., et al., 2001, Building A 'GenBank' of the Published Literature, *Science 291(5512)*, 2318-2319 <http://www.sciencemag.org/cgi/content/full/291/5512/2318a>.

Rohe, T. A., 1998, How Does Electronic Publishing Affect the Scholarly Communication Process?, *Journal of Electronic Publishing 3(3)* <http://www.press.umich.edu/jep/03-03/rohe.html>.

Rowen, L., Wong, G. K. S., Lane, R. P., et al., 2000, Publication Rights in the Era of Open Data Release Policies, *Science 289(2000-09-15)*, 1881.

Rowland, F., 1994, Electronic Journals: Neither Free Nor Easy, *EJournal 4(2)* <http://www.people.virginia.edu/~pm9k/libsci/rowland.html>.

Sietmann, R., 1999, Zirkelspiele. Die wissenschaftliche Literaturversorgung steckt weltweit in der Krise, *c't*, 20, 216-231.

Strong, W. S., 1995, Copyright in the New World of Electronic Publishing, *Journal of Electronic Publishing 1* <http://www.press.umich.edu/jep/works/strong.copyright.html>.

Taubes, G., 1996, Electronic Preprints Point the Way to 'Authors Empowerment', *Science*, 271, 1996-02-09, 767-768.

Thatcher, S. G., 1996, Re-engineering Scholarly Communication: A Role for University Presses?, *Journal of Scholarly Publishing 27(4)*, 197-207.

Tomlins, C. L., 1998, The Wave of the Present: The Printed Scholarly Journal on the Edge of the Internet, *Journal of Scholarly Publishing 29(April)*, 133-150.

TRLN (Copyright Policy Task Force of the Triangle Research Libraries Network Durham/Raleigh/Chapel Hill), 1993, *Model University Policy Regarding Faculty Publication in Scientific and Technical Scholarly Journals - A Background Paper and Review of the Issues*; Last update: July 1993 <http://www.lib.ncsu.edu:80/scc/trln.html>.

Ullman, J. D., 1996, Research Publication Modes Need to be Reengineered. A discussion, *Computing Research News*, July <http://www-db.stanford.edu/~ullman/pub/nopaper.html>.

van Reenen, J., 1998, Library Consumerism in the Digital Age [Paper at the Faxon Institute Colloquium "Electronic Publishing and the Scholarly Communication Process", 7-8 January 1998], *Journal of Electronic Publishing 3(3)* <http://www.press.umich.edu/jep/03-03/vanreenen.html>.

Walker, N., 1995, The University Press in the 21st Century, *Journal of Scholarly Publishing 27(1)*, 37-42.

Walker, T. J., 1998, Free Internet Access to Traditional Journals, *American Scientist 86(5)* <http://www.sigmaxi.org/amsci/articles/98articles/Walker.html>.

Whisler, S., Rosenblatt, S. F., 1997, The Library and the University Press: Two Views of the Costs and Problems of the Current System of Scholarly Publishing, *Andrew W. Mellon Foundation Conference "Scholarly Communication and Technology"*, 1997-04-24/25, Emory Univ. <http://www.arl.org/scomm/scat/rosenblatt.html>.

Wittenberg, K., 1998, CIAO: A New Model for Scholarly Publishing, *Journal of Electronic Publishing 3(4)* <http://www.press.umich.edu/jep/03-04/ciao.html>.

Zeigler, J. F., 1997, Gutenberg, the Scriptoria, and Websites, *Journal of Scholarly Publishing 29(October)*, 36-43.