SCHOLARLY COMMUNICATION

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This paper is a slightly revised version of a paper given at the SCONUL Annual Conference, Dublin, March 1999.

Existing systems, which are based on peer review, formal publication and surrender of copyright and characterised by increases in volume and costs, and lack of competition, are an obstacle to scholarly communication. Through a joint approach by all participants in the communication process, it may be possible to find a solution to the problems. Such a solution will probably require a blend of co-operation and competition in order to remove the current monopoly power.

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Yogi Bear, the US basketball player, known for his John Prescott-like mode of speaking, once said "The future ain't what it used to be". That description is very true of the issue of scholarly communication. In this paper, I intend to give a short overview of what I see as the broad picture of scholarly published communication, placing the library in a wider context.

The crisis in scholarly communication

It is common to hear it said that there is a crisis in scholarly **communication**, and not too uncommon to hear this crisis outlined purely in terms of the serials problem with which libraries have been battling for the past fifteen years or more. The problems of scholarly communication may be central to libraries, but the whole problem of scholarly communication is not simply a library-related one, and that is a theme which I think we should hold in our minds. There are many players in this game: authors, readers, staff and students of our institutions, university management, research councils, funding bodies, government bodies, libraries, publishers. My point is that critically only the first two really matter. All the others function as enablers, in one way or the other, of the process, if communication is the purpose of the enterprise. As we shall see, that may be an important qualification.

The basic system of scholarly **communication** has, until recently, not changed significantly since Gutenberg. It is based on three processes. The first is that of informal networks, which often start locally and gradually move outwards to be international – the old "invisible college" concept. Now this is handled via e-mail, listservs, web archives, etc. Secondly, there is the initial public dissemination of research, which may take place, e.g. at conferences or via preprints. Finally, the research may be formally

published in, it is hoped, prestigious journals. The Internet is now an overarching element to all three, since it may provide the transport for all of these.

The problem in scholarly communication is the inability of the whole system to achieve the purpose of communication cost-effectively. The existing system does not help either original producers or users. Producers find it difficult to get material into the literature because the process takes time. Users do not gain access to the material they want as readily as they would like. Scholars find it increasingly difficult to handle the growing volume of scholarly information, informal or otherwise; information overload occurs, and there is a lack of time for reflective thinking. The system is not capable of changing with sufficient rapidity to reflect changes in intellectual development.

The crisis in scholarly publishing

1. Publishing

The crisis in scholarly **publishing** flows from some of these problems and also contributes to them. The scholarly publishing structure is built on three pillars. These are, firstly, peer review (to which the greatest importance is attached); secondly, the formality of publication, particularly within journals; and thirdly (and critically) the wholesale surrender of copyright, which is integral to journal publishing.[6] I shall return to these individually.

If we look at features of the academic publishing scene, there are four which stand out. The increases in the **volume** and **cost** of information are, of course, well-recognised key factors, together with a shift towards information content being treated as a commercial commodity. The broad picture is well known. The following two figures illustrate costs in relation to periodicals over the past 10 years (Fig. 1) and the growth in the annual output of articles over the past 20 years (Fig. 2). The latter is caused as much by the growth in the number of researchers and by current academic cultures, as by anything else. The growth in web sites (Fig. 3) has been even more dramatic. Secondly, the key economic feature has been how the absence of **competition** has enabled prices to remain high. Several studies have shown that rising costs alone do not justify the higher prices which are charged.[9] Other studies have shown that the profit levels, in terms of their net profit margins and their return on equity, of companies such as Elsevier, Plenum and Walters Kluwer are surprisingly high relative to the publishing industry as a whole.[17] The situation is made worse by the entry of new journals to the marketplace, which draw off revenue from existing titles. The third feature, **mergers**, aggressively pursued by some publishers, also exacerbates this problem.[8] The merger of Ovid with Walters Kluwer and AOL, bodes ill for the future. Libraries are "customers in a non-scholarly communication market which is too expensive for our participation in the breadth and depth needed for a healthy system"[17].
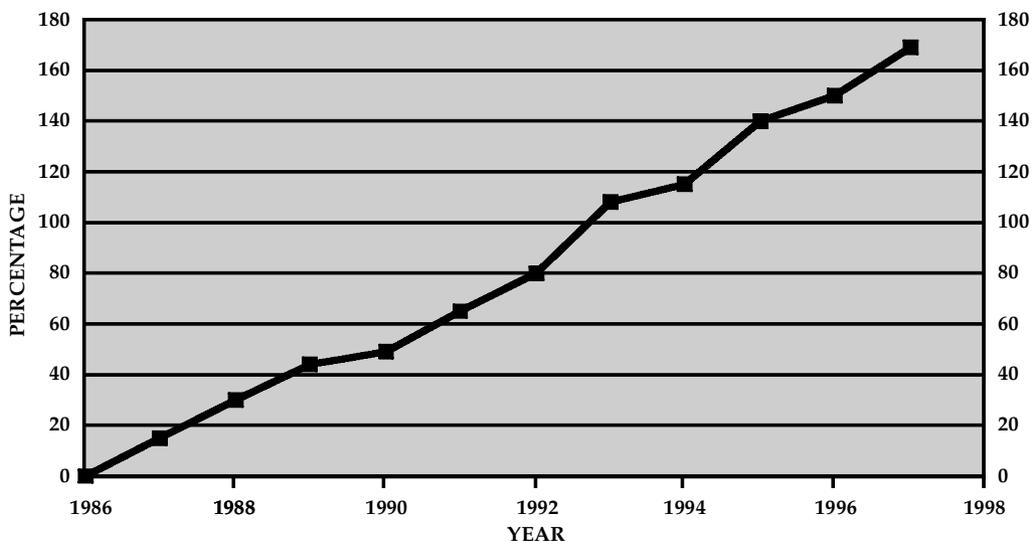
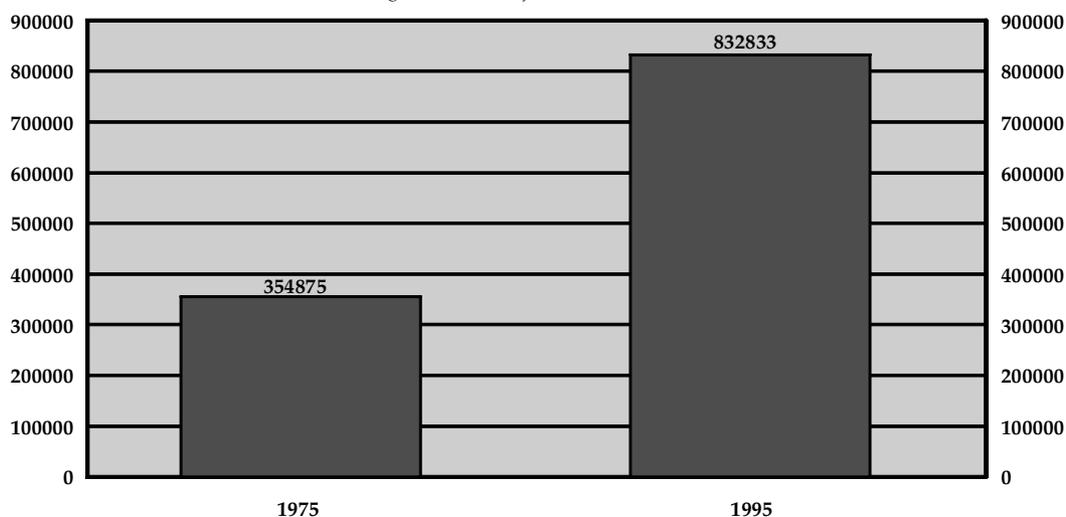*Fig.1 Increase in periodical prices*

Fig. 2 Increase in journal articles

Alongside this, and partly because of it, has been the fourth feature, the steep **decline in monograph sales**, identified particularly by American university presses. Monographs are not selling because libraries are not buying.[4]

Within this framework, the traditional roles of both libraries and publishers are being challenged. Publishers and electronic services may be able to bypass libraries by delivering products to users directly, with libraries operating merely as brokers. Researchers and their research assistants are using the Net to obtain information from web sites, from colleagues, etc. Publishers should not sleep too easy in their beds either: the journals market is looking like a house of cards. The key lesson here is that the issue is not purely a library-publisher one. It is one in which all the appropriate players have to be involved. Solutions to the problems of scholarly communication **and** scholarly publishing have to be developed by all or most of these players.

2. The barriers to change

The primary barriers to change are essentially the way that economic and cultural incentives still work to reinforce the existing system, even if the system is imperfect. Although I concentrated in the last section on what were supply side issues, namely problems within publishing, these barriers exist in both the supply **and** the demand sides of the system. The way in which costs are attributed in the present sy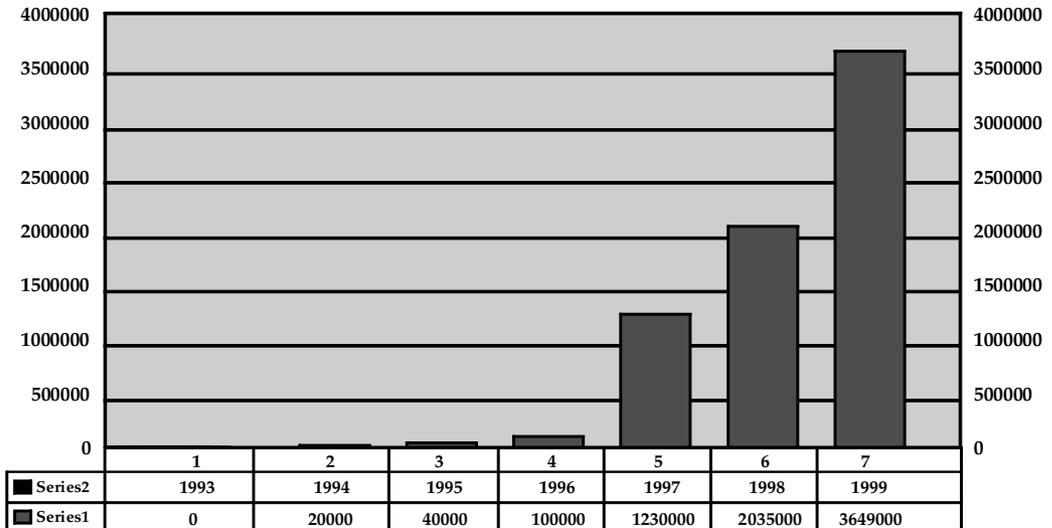stem does not encourage change. In the present system, users are protected from direct accountability for publication costs (in practice, partly because of central library funding). There is no obvious need for authors to consider the costs to libraries or to the whole communication system.

The "publish or perish"[1] syndrome also acts to prevent change. The pressures from senior scholars, professional societies, Research Assessment Exercises (in the UK), and the way in which appointment committees work, all push towards early publication. A recent study by Fytton Rowland shows that the publishing system in the UK now (and I cannot believe that the same is not true elsewhere) has "as much to do with a scholar's career progression as with the dissemination of knowledge".[12] The system operates effectively like a medieval guild. That is the new cultural incentive, and it is different from the incentives which operated in the Gutenberg era.

There is a barrier, too, in the monopoly situation which exists in the journals publishing market. This has always existed, but is now being strengthened as a result of recent mergers. As a result, if we think of publication in a market context, the user is disempowered, because the product is "must-have" and "single-source". There is no (or little) competition. In the past, of course, lack of competition has not been thought of as a disadvantage. It only becomes so when the system is not working effectively.

The disincentives to the creation of alternative models are many and well-known. There are queries about quality, and about the status of

Fig.3 Growth in web sites (Source: OCLC)

	1	2	3	4	5	6	7
■ Series2	1993	1994	1995	1996	1997	1998	1999
■ Series1	0	20000	40000	100000	1230000	2035000	3649000

such alternative "publications". Fytton Rowland's study showed that reputation and impact factors are major decision points in deciding where to try to get published. It takes time for publishing channels to acquire the right reputation. Undertaking editorial work on such alternative publishing models is not yet highly regarded, and young scholars who might have the drive and adventure to start new communication models are pressured to work within the guild rules.

There are also economic disincentives (or at least perceived disincentives) to changing the publishing system. There is as yet no certainty about the real economics of the alternative models. This subject has spawned a large number of papers (in both print and electronic form!), so it is impossible to do it justice here. The perceived uncertainty is, itself, enough to be a substantial barrier.

It is, therefore, clear that it will need considerable drive, influence and concerted action to establish the level of organisation, to create competition to established communication channels.

3. New approaches

Digital developments have, however, made new approaches possible. Some of these are well-known, but it is likely that there will be further changes in the forms of communication.

(a) Electronic journals have developed rapidly in the last few years. Some are independent productions and new publishing ventures have sprung up. It is worth noticing, however, that what has actually led to the explosion of such journals has been the way in which conventional commercial publishers have moved into this activity. Several publishers have set up integrated services providing access to all their electronic journals via sophisticated search facilities. Will such changes within conventional journal publishing solve the crisis? The evidence to date suggests that this is far from likely.

(b) Electronic pre-prints are another modification of an old model, but one which has taken on a distinct new character. The example of the Los Alamos archive is well-established, and the e-Biomed/PubMed Central initiative in the USA, originally proposed in March of this year,[16] seems likely to join it, although the precise basis on which it will operate is as yet uncertain. Such structures need managing, and they need a critical and appropriate mass of users to use them. It may also be significant that the existence of the Los Alamos archive has neither killed off physics journals, nor led to a decrease in their prices.

(c) Electronic books have not yet made a major break-through. Views on the viability of such a product in practice have waxed and waned. The Columbia Online Books Evaluation Project has produced positive results in certain respects and initiatives such as the Gutenberg-E Project are being launched. Whilst Clifford Lynch of CNI has expressed negative views. I suspect, however, that there may be

possibilities for electronic creation of text through-to-demand printing in perhaps 3-5 years time.[2,4,5,10]

(d) Generic one-stop provision represents a genuine new model, rather than a modification of old ones. Multi-disciplinary databases such as OCLC's Electronic Collections Online, and the aggregator services provided by agents, e.g. the SwetsNet and Masterfile services, provide front-ends with search facilities to collections of journals from a growing number of publishers.

(e) Discipline-specific "one-stop shopping" is also a new phenomenon. Services such as BioMedNet, TipTop in Physics and ChemWeb, all of which have a club atmosphere, combine news and discussion groups, as well as scholarly material. In this way, they create what might be called a knowledge environment.

(f) Subject portals accessing web sites now seem to have been around for years, prompted, in the UK at least, by work funded by the eLib programme in its earliest incarnation.

The key element in at least the last three of these is the new feature of interconnectness, where information is thought of as a series of interlinked content and index databases. This is perhaps most strongly illustrated by the way in which OCLC have linked their FirstSearch both to Electronic Collections Online services, and also potentially to local systems. Competitive edge has come through the ability to muster a critical mass of quality information through a single user-friendly interface.

Many of these products are now, of course, largely additional to existing publications and services, and not replacements for them. They may offer new possibilities, but will they lead simply to more overload and to higher costs?

4. So what is to be done? (with apologies to Lenin)

There are two basic approaches to answering this question. Is it to be handled by **co-operation** or **competition,** or by some combination of the two? Following on from this, the major question has to be asked: what will be the **intellectual property** situation?

4.1. Co-operation

This has been the pragmatic (or perhaps realistic) approach. The rationale for this has been the belief that we can exercise some leverage on the system, either communally or individually.

(a) The communal approach is best illustrated by the development of consortia. These have been well-established in the USA, and much later here in the UK. Regional consortia have developed in several countries and, on the international scene, the International Consortium of Library Consortia[7] has provided a forum for co-operation. On the UK national scene, CHEST has done solid work for several years. Most recently, the National Site Licensing Initiative (NESLI) has been working in this mode within the UK. It has advertised itself as an initiative which, recognising the realities of the present environment, seeks win-win solutions: "What's in it for libraries, for publishers, for users, etc.?". Offers are beginning to emerge from NESLI. The first (Blackwell Science) had a good take-up, and further offers are continuing to appear. It is proving an extremely complex and arduous enterprise. Nevertheless, it is making solid progress. Communal power is being exercised for the HE library community as a whole, and a standard model licence has been (almost!) established. Both are real achievements. If one was to criticise, it might be, firstly, to recognise that there is possibly a lack of flexibility in what can be obtained since NESLI is trying to meet the needs of all institutions; and secondly (and perhaps more seriously) that we have not really yet seen any significant alternative economic models being proposed, although that may be about to change. This latter is difficult, since the offers are coming **from** publishers rather than being suggested to them, and it may now be worth considering whether more initiative could come from the community in the light of early NESLI experience. It is only just becoming possible to move the publishing community into an environment of unbundling the print and electronic products. This is not perhaps surprising, since not only is this introducing a high risk factor into their calculations, but the

academic community, itself, as a whole has not yet fully moved into that environment.

(b) Individually, some institutions have initiated other approaches. At least one Australian institution has cancelled print on a large scale and negotiated electronic-only deals with one publisher. California State University has issued an RFP for the supply of a core collection of 1,250 serial titles in electronic form, thus identifying the material the institution wants, rather than accepting or rejecting the content offered by publishers.[11]

(c) The PEAK project in the USA, involving the University of Michigan and other US universities and Elsevier Science, is a further co-operative attempt to identify new models.[3]

The basic problem with these approaches is that they still leave monopoly power in the hands of the publishers. As one writer remarked, "this is not the dream of independent scholarly control. It is the nightmare of unregulated monopoly control".[14] They do not really change the terms of trade.

4.2. Competition

This has been a major alternative thrust in recent years, led from the USA, where some have argued that the fundamental problem of a lack of control by the scholarly community cannot be addressed through negotiation. The argument has been that the system has either to be competitive or one which is not predicated upon the generation of profits from the communication process itself. The idea has been to develop structures which meet four criteria. They must:

• regain control of the process;

• decouple peer review from distribution;

• develop alternatives to commercial publication,

• make these attractive to scholars, which is particularly critical, for, without it, failure is guaranteed.

There are several examples of what has been done within this kind of framework: -

(a) The Scholarly Publications and Academic Resources Coalition (SPARC)15, set up by the Association of Research Libraries, has been designed to start new journals in direct competition in terms of their subject matter with titles considered to be particularly expensive.

(b) The NEAR initiative, originally suggested by the Provost of the University of Kansas, has proposed the creation of a permanent national electronic archive of material produced by US academics. The academic would only licence the print publication exclusively for a period to the publisher, but would retain a portion of that copyright to enable the deposit of an electronic version within the archive.[13]

• Highwire Press is a joint venture between Stanford University Libraries, a number of scholarly societies, and what were described as "responsible publishers" to make electronic versions of existing print journals available within a controlled scholarly environment.

What cannot yet be said is that these alternatives have established themselves on such a scale, individually or communally, to wrest control of the process from commercial publishers. Major existing publishers have a massive head start, and are working on many of the desirables: attractive search facilities, scale of coverage and operation. They also have control of one of the barriers within the equation, that of intellectual property and copyright.

5. Intellectual property

We are all aware of the problems presented by the monopolistic control of copyright by publishers. Libraries are very conscious of the aggressive way in which publishers are seeking not only to retain their rights, but also to strengthen them through the Copyright Licensing Agency (CLA), within the EU, and other fora. There is a very real danger that even existing possibilities for scholarly use will be withdrawn from us.

Again, the USA has been taking the lead in responding to these. The California Institute of Technology (which actually co-owns copyright with its faculty) has proposed that researchers should retain copyright and only licence the material to publishers for specific purposes. This follows on other initiatives from ARL and the Association of American Universities (AAU), which have nevertheless not significantly disturbed the status quo. In this country, there has been less dramatic activity. The Authors

Licensing and Copyright Society (ALCS) has been trying to recruit academic authors to their cause. The Association of University Teachers (AUT), whilst encouraging the idea of authors retaining copyright and licensing it, still seems as worried about institutions seeking rights as with publishers flexing their muscles. EBLIDA and SCONUL are taking a lead in lobbying in several quarters, and at various levels, in relation to UK and, particularly at present, EU developments. However, this will be a long haul. Let us not deceive ourselves: the power of publishers is very strong, and it will require considerable effort on the part of the higher education and library community to resist unreasonable demands.

6. The scholarly community's problem

At the beginning of this paper, I made the distinction between the problems of scholarly communication and those of the library. The need is now to convince other partners that the library problem can only actually be solved, if it is recognised as part of the wider scholarly communication problem, and the whole set of problems are addressed together. Perhaps, too, we need to show that the scholarly communication problem cannot be solved by bypassing the library costs problem and hoping that it will go away with the fuller use of new technologies. That means partnership between those players who are willing to pull in the same direction. I mentioned the well-known "Publish or perish" slogan earlier. Perhaps the new slogan should be – and there is nothing original in this, as it is the title of an issue of Policy Perspectives[1] – "Publish and perish".

In Arcadia, we could expect that:

- the scholarly community would revisit its core values, and particularly the relationship between peer review and dissemination;

- the whole community would seek to retain fuller control of its intellectual property;

- individual scholars would be aware of the consequences of loss of IPR, and any new models of information provision would address the weaknesses of the present position very practically;

- universities would revisit their appointment, promotion and reward systems as a shared perception;

- funding agencies would support all these changes in their policies because the attitude of institutions and funding agencies are key to the whole activity and institutional and community backing is essential, for, without these, the rest would fail.

- libraries would use their leverage to create a partnership with these other groups in order to improve market conditions in academic publishing which reflect the values of scholarly communication;

- commercial publishers would see their work as much as a contribution to scholarly knowledge as a means of maximising profits for shareholders.

We do not live in Arcadia. Perhaps this quote from Robert Jervis, "You cannot change a complex organism, you can only disturb it.", is appropriate. Just to recite all these may make the heart sink. Nevertheless, if we regard this as Arcadian, we also have to consider the alternative picture. As practitioners, we have to note that most of these are demand-side issues, and in the hands of our institutions and funding bodies as much as in those of publishers. No doubt we shall have to blend the co-operative and competitive approaches. We have to identify which of these, and how far along these roads we can realistically travel, if we are to avoid the increasingly powerful exercise of monopoly power, and its serious impact on scholarly communication. In this way, we can then determine ways to start the process of constructive disturbance.

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