The Impact of Electronic Publishing on the Academic Community

Session 1: The present situation and the likely future

The future of the World Wide Web and its impact on our institutions

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The technology of the World Wide Web is evolving rapidly and unpredictably. The World Wide Web Consortium co-ordinates many activities in the areas of user interface, technology and society, and architecture. The Web is likely to have a profound impact on traditional institutions such as publishers and learned societies. Can they survive in an era when anyone can reach a worldwide audience? They are well qualified by their experience and knowledge to validate information on the Web, and bring structure to its chaotic material. These are essential services for readers. Institutions that offer them can play a valuable role, provided they can adapt to the new technological and economic realities.

Technical evolution

The future of the Web is unpredictable. Change is too rapid, and is taking place on a broad front. In addition, it is driven by powerful interests and market forces over which we have little control. Commerce, entertainment, broadcasting, telecommunications and the computer industry are all involved. It would be rash to guess the outcome, although we can hope that some of the present performance problems will be resolved in the course of this evolution.

On the other hand, we can get a good overview of technical issues by looking at the current activities of the W3 Consortium [1]. The Consortium aims to realise the potential of the Web by maintaining an open system in the face of rapid advances in technology. They divide their activities into several areas: user interface, technology and society, and architecture. Here we can only take a superficial look: the W3 Website has more detailed information.

User interface
The hypertext mark-up language (HTML) is evolving to cope with graphics, mathematics, etc. Work on style sheets and fonts will offer improved control over presentation. Higher quality printing and more reliable handling of colour are under development. Other areas of study include three-dimensional presentation and interactive interfaces. Internationalization is an important issue: the Consortium aims to enhance the Web to meet the needs of the global community, including non-Western character sets, languages and writing systems. Another aim is accessibility for people with disabilities.

**Technology and society**

Privacy is an important issue: publishers would like to find out about their readers, but readers want control of what information is available. Work is also under way on intellectual property rights, digital signatures and the many problems surrounding payments. The field of security extends to accounting, access control, integrity and risk management. Another important development is PICS, the platform for Internet content selection. This system allows information on the Web to be labelled and rated in various ways. It thus offers control over access to material without affecting the author's right to publish. It also has potential for the development of more informative navigational tools. Another set of problems is related to collaborative document development. This was a feature of the early Web, but has been somewhat lost in the current polarized provider-consumer model.

**Architecture**

The huge growth in Web traffic threatens to overload the Internet and degrade its performance. It is important to protect it by designing better protocols. These should lead to improved reliability and efficiency for users. The Web also needs to be able to take account of more kinds of 'objects' than it does today, and to handle temporal relations between them. This could pave the way to 'CD-ROMs on the Web'. Improvements in distributed indexing and searching should lead to better strategies for resource discovery.

**The impact of the Web**

I should like to turn now to quite a different topic: the impact of the Web. Can we simply carry forward into the new medium (with some technical improvements) the institutional structures that exist today? Perhaps I should start by drawing your attention to some barbarians at the gates who are asking radical questions [2]. Are our institutions still relevant? Might they even be pernicious? We too must ask what purpose these institutions (publishers, learned societies, academic journals) really serve. Could there be something better?

"Knowledge is power". Should it should be freely available? This is an old debate, stretching beyond the Enlightenment and the Encyclopedists, to the Reformation and beyond. "I will cause a boy that driveth the plough shall know more scripture than thou dost" was a challenge by those who planned to destroy the monopoly of arcane knowledge, and liberate ordinary people. That debate is now won: anyone in what we call the West can read The Bible and encyclopaedias (and a lot more besides). The Web is busy spreading knowledge still further. But who decides what will be published?
The Web empowers individuals: they can easily reach a worldwide audience. Anyone [3] can publish material that would never have been published in the past, and it is instantly available to millions of people. This is an impressive achievement: but there are drawbacks. People publish all kinds of things, with a vast range of interest and reliability. There are learned journals on the Web, as well as other useful and interesting information, but also a lot of fairly worthless material. Readers need help, and this help can come from many sources: friends, experts, catalogues, search engines and browsing.

How can I find what I want; how do I know if it's right? Is there anything better (more accurate, more thorough, more relevant, better written, more entertaining)? Clever software alone cannot answer these questions: they involve judgements of value. Human help is needed somewhere in the process, and institutions can offer this help.

Unfortunately, institutions bring their own baggage, which could be harmful. They help us to find the information we need, but at the same time they influence what constitutes knowledge. Will publishers help us find our way in cyberspace, or will they decide what's good for us to know? Are learned societies a guide for the perplexed, or do they define and defend the view of an establishment? Extra ecclesiam non est salus (there is no salvation outside the Church) seems an outmoded doctrine in our scientific age. But are we so sure? [4] There is pseudo-science and pseudo-fact. Who is to distinguish them from 'real' science and 'real' fact? The Web brings this problem into sharp focus.

There is a long tradition of criticising learned societies on the grounds that they stifle debate and creativity, and pander to the interests of a self-serving elite. Hanson [5] gives some historical examples as well as leading his own attack. Even some contributors to this conference have dropped hints of this kind. But while we should naturally be critical, we should not undervalue the positive contribution that institutions can make. Everyone at this conference at least seems convinced of the usefulness of peer review (although Hanson is not).

In principle, the Web offers us the best of both worlds. Anyone can publish: their views cannot easily be suppressed, for good or ill. And anyone can comment, validate and offer judgement or advice, as in Ginsparg's 'layered journals' (see Session 1 in this volume, and [6]). The right economic model has been much debated: it will probably be very different from the one we have today. But at the intellectual level a 'value-added' model is attractive. We can let a hundred flowers bloom (or millions) and still define a canon.

But who is to define a canon? Anyone can do it now. So the reader is again thrown back on institutions. Just as in real life there are many kinds of institutions. In the short term we shall probably have confidence in the same ones as in real life [7]. These may evolve into 'cyber-institutions', and new ones may replace or complement them. People will need to learn the value of institutions in cyberspace. Apart from their historical legitimacy, they must be visible and reliable. Then they can add structure to the environment. Bennett [8] puts it well:

*The challenge and the opportunity for learned societies is to assess the quality of resources through peer review, to provide assessments to scholars in the field, and to organise access to the full range of validated materials in an easily*
navigated, intellectually thoughtful manner.... Learned societies are best situated to perform this role because they are best able to organise the peer review process by which resources should be assessed.

Landshoff rightly points out that we should be cautious about changing institutions that work, including successful journals. Unfortunately, it is easier to dismantle valuable institutions than to create them. There is often an irrational or historical element [9] in their success that we cannot necessarily reproduce (or understand). This may be one message behind Harnad's 'tale of two journals' (see Session 1 in this volume, and [10]), reminding us how technology is embedded in society.

Another important point is that cyber-institutions must be skilled in semiotics. They must offer clues to guide us intuitively around the new landscape. In real life, learned journals look quite different from crime paperbacks. We also find them in different places (academic libraries, airports). But on our computer screens these distinctions are lacking. Search engines respond to our queries with material of wildly differing scope and quality. We need to organise a social cyberspace more like the real world, where we can tell the difference between a reference library and a nightclub. Providing the right signals will be a challenge for 'validators': it will not be easy. A hypertext article or a single website may be designed, but the World Wide Web itself is not. This is its strength and its weakness. But we can take heart: the real world was not designed as a whole either.

Institutions such as publishers and learned societies can play a vital role on the Web. Using their extensive expertise, they can help the reader by organising and judging material in a variety of ways. But they need to adapt to the new medium, which has very different economic and social characteristics. They need both to assume their responsibilities and to be flexible, or they will be overtaken by events.

**Discussion following presentation by Sendall**

Several discussants were concerned about the mechanisms under development for charging for access to electronic material. While some discussants were opposed to the principle of charging for access, others accepted that this would become common place once the means were established. A rate of around $1 per hour proposed in the United States was mentioned. A representative from the European Commission reported that an earlier proposal for an 'information tax' had not been well received in the Commission. De Kemp was concerned that telecom or information technology companies might secure control of bandwidth and introduce charges on the academic community. Butterworth agreed that the academic community and its representative bodies should be alert to this possibility and should promote the interests of the academic world.

**Notes and references**

2 "Our policy-makers and media rely too much on the 'expert' advice of a self-interested insider's club of pundits and big-shot academics. These pundits are rewarded too much for telling good stories, and for supporting each other, rather than for being 'right'." Hanson, R. (1996) *Idea futures* at [http://hanson.berkley.edu/ideafutures.html](http://hanson.berkley.edu/ideafutures.html)

3 'Anyone', 'easy', etc. conceal a difference that we should not forget: between those with a desktop computer and modem, and those without (the majority in world terms).


7 The conservative view of institutions was famously stated by Bagehot: "Other things being equal, yesterday's institutions are by far the best for today; they are the most ready, the most influential, the most likely to retain the reverence which they alone inherit, and which every other must win.", Bagehot, W. (1867, published in 1963) *The English Constitution*, Fontana, London


