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It’s a great pleasure and honour to be back here in King’s College, where I spent many happy years. In particular it’s a great privilege to be speaking here in the Great Hall. I’ve spent many sleepless afternoons sitting here listening to the interminable debates of Academic Council on such absorbing topics as term dates or the number of contact hours in a module.

Long after the title and abstract for this lecture had been prepared, I discovered that Wired Magazine has created the Wired Index Fund\(^1\) to track the growth of companies that are building what Wired calls “the new economy”, a broad range of enterprises that are using technology, networks and information to reshape the world. One of the forty companies selected by Wired is the Walt Disney Company. The Walt Disney Company is one of those cute cuddly companies with such cute cuddly characters as Mickey Mouse, squeaky clean theme parks like Disneyworld and instructive children’s activities such as the Epcot Centre.

But there is a darker side to the motherhood and apple pie, in the way in which these large corporations wittingly or unwittingly are subverting other parts of society – including academic life – for selfish concerns. Let us just look briefly at the nature and scale of the Walt Disney Company. According to its latest annual report, for 1998\(^2\), the Disney Corporation has turnover of twenty-two billion dollars; that compares with turnover of some fifteen billion dollars for the whole of UK Higher Education. Their profit is some
four billion dollars a year where UK Higher Education might charitably be described as close to zero. For most of the world – and notably for Higher Education – copyright and intellectual property rights are seen as intractable problems; for Disney this is not so. After lobbying (and I’m not sure if that’s a euphemism) the US Congress, US copyright has been extended for twenty years, thus saving Mickey Mouse from the horrors of the public domain, or as Disney’s annual report proudly states, preserving our cultural heritage. And the tentacles of Disney stretch even further and into television. For example they own the History Channel.

Consider a typical day’s programming on the History Channel:

Last Thursday’s programmes (a randomly chosen day) ran to biographies of those Giants of the Twentieth Century (sic), Sidney Poitier and Amelia Earhart; The Boy Generals of the Civil War (which civil war is unspecified); Civil War Journal: the Battle of Antietam (again we are not told which civil war); Famous small arms; The Great Sphinx, Guardian of the Ages; From the Bomb to the Beatles: I Witnesses; Edward Windsor Presents (presumably to be renamed the Earl of Wessex Presents in future); Hidden Cities of the Etruscans; Secrets of War: Nazi Gold and finally Secrets of War: Battle of the Atlantic. Just to look at this last, a subject covered by the Department of War Studies here at King’s College, one wonders how far a forty-five minute programme will cover the eight or so schools of thought on how and why the Battle of the Atlantic was won and will represent fully the
latest two volume revisionist history\textsuperscript{4} which runs to 1700 pages and considers the whole thing a British propaganda exaggeration. These are on the whole well made and intelligent programmes, but they give a wholly based and eccentric view of the development of world history.

But of course the issue is not simply one of the Disney Company. UK Higher Education also operates in a global environment and has to generate revenue to survive. Mike Fitzgerald, until lately Vice-Chancellor of Thames Valley University and a great proponent of the knowledge economy has often spoken of the importance of the creative arts to Higher Education and has been fond of noting\textsuperscript{5} that the Rolling Stones are now a larger producer of overseas earnings than the British steel industry.

Much of the dark side of global corporate behaviour focuses on the role of IPR, where a copyright everything then sue on sight culture appears to have emerged. This may be compared with Higher Education’s cheerful – or is it wilful – unwillingness to tackle such basic issues as the ownership of course materials. At the same time it should be noted that there is a great even Gadarene rush into distance learning, Continuing Professional Development and virtual universities, although universities have a quite inadequate sense of who owns any of their web-based materials. And getting it wrong can be costly. Consider recent high profile examples, such as the Elvis Presley shop in London, sued by the Presley estate for having the temerity to use his
image to produce souvenirs. How can a corner shop fight a multi-national corporation? Or the Diana Princess of Wales estate, using all its income in legal fees to sue souvenir makers. Or Macdonald’s attempting to trademark the name in Scotland (fortunately to howls of derision), or the All England Tennis Club attempting to copyright the name Wimbledon.

It should perhaps come as no surprise to find that double standards operate. The self-same Walt Disney Company which has persuaded Congress of the importance of extending intellectual property rights has itself been sued for over $2 million dollars by ProActive Media. They claim that Disney has taken out a single subscription to its newsheet Multimedia Wire, which costs $500 and has made up to thirty-five multiple copies for distribution to managers. Disney’s somewhat lofty response has been to offer to take out a further ten subscriptions. That will really dent the four billion dollars annual profit. This sordid little case is somehow reminiscent of Robert Maxwell’s systematic multiple copying of review copies of software.

In his annual letter to stockholders, Michael Eisner, the CEO of Disney talks of “King Content and Queen Creativity” allied with technology. Allowing for the dash of purple prose, this is precisely the sort of statement one might expect to come from any digital libraries funding agency and shows that we are aiming at similar tools if not similar outcomes. Let me
briefly look at what seem to be the key issues for the academy in its pursuit of the digital library.

Perhaps curiously I do not see content as a major issue, or rather I see it as one on which we are making good progress. The papers at this conference demonstrate the richness and fertility of the approaches to all aspects of digital resources which the academic and academic publishing communities. Metadata remains an issue, but again it is one where we have made enormous strides and where work on the Dublin Core shows enormous promise. Preservation is the most commonly shared area of concern and a whole range of issues from the technical to the philosophical remain to be addressed. A further key issue which is much neglected is that of user support, education and instruction. Some of the work of David Squires in the Faculty of Education here at King’s demonstrates the complexity of the issues here. And, lastly, a personal obsession, to which I shall return, network topology.

I would now like to turn to the Internet and the facile assumption that it is a value free environment where every activity has equal status. In practice it meets few of the requirements of good scholarship, while being excellent as a current awareness and reference tool. It is sometimes easy to forget just how recent a development the Internet as we know it is and how rapid has been its uptake. The first web browser was created only in 1994 and it took
a mere four years to reach fifty million users. Compare this with radio, which took thirty eight years to reach that number of users and television, which took thirteen years. Currently there are over seventy million users and it has become what the late lamented Paul Evan Peters called “the largest mass migration in human history”. That rushed introduction and uptake has resulted in little real discussion taking place on its appropriateness for scholarly communication.

The very act of naming and identifying electronic objects consistently is fraught with difficulty. A book is a static object, which does not change over time. In an electronic environment there is a need to reference objects as they move and change over time and place. The temporary nature of URLs is notorious. It has been claimed that they have an average life span of seventy-five days. I was involved in teaching a course recently which involved citing some 64 URL’s. These have changed or disappeared at the rate of four a month over the course of one semester – and that in the field of information management! Even where the URL remains constant issues of version control and quality assurance remain unresolved. The seriousness of this problem cannot be overemphasised for the continuity of citation is central to scholarship and without it scholarship cannot flourish. Some attempts are being made to deal with this problem, the current favourite being Digital Object Identifiers. These originate from the commercial publishing world and it is not then clear whether they have
validity and applicability beyond the commercial sector. A significant if unquantified proportion of the material held in any library and in any medium is either non-commercial or out-of-copyright and any new system must be able to embrace everything from incunables to examination papers.

The issue of naming objects is also difficult and as yet unresolved. At present anyone can name an object with no obligation to maintain names over time. This is compounded by the fact that many of the reference points we take for granted in the print world disappear. A book published by Oxford University Press implies a set of values, standards and scholarly rigour that is understood. But an address incorporating the phrase “ox.ac.uk” could be anything from a university press to a student p.c. in a rented room. The persistence of object names is a long way from having a settled structure – and there is little evidence that the official bodies in scholarship understand the threat this poses.

Metadata and the description of objects is in rather better case. The Dublin Core standard first produced by Stu Weibel at OCLC has very rapidly developed international acceptance with participation in standards work from Europe, USA and the Pacific Rim. But even here much work remains to be done. Cataloguing has historically described static and largely immutable objects. The Internet offers new genres of multimedia and even
services which will require appropriate description. This work remains to be developed.

Unlike the book, terms and conditions of use must also be described for electronic materials. Many will have multiple copyright permissions, many will be licensed rather than purchased, many will have restrictions on categories of users – and these will vary according to the terms of sale rather than be inherent in the product. Although the initial success of the Dublin Core gives confidence that these problems can be resolved, a great deal of international effort will be required to create a usable system.

Searching and indexing have proved much more difficult technically than the designers of web robots would have us believe. Web indexing systems are breaking down as their architecture collapses under the weight of data. It is increasingly common to undertake a search on Lycos, or Excite or Infoseek and recover hundreds of thousands of hits in apparently random order. Much work is going on here but designers despair at the inability or unwillingness of the public to master Boolean searching and most systems still have a long way to go to beat a half way competent reference librarian.

Unlike the print world, the electronic one will require validation of the rights of the user. User authentication is regarded as an essential element of electronic commerce, but it too lacks basic elements for the furtherance of scholarly activity. At present there are no good ways of proving membership
of the “data club” when away from the parent institution. Scholars visiting another institution, students on vacation or researchers on field trips are difficult to validate. There is then a very knotty problem surrounding usage data. On the one hand commercial publishers wish to collect usage information as a marketing tool. They are, however, unwilling to release this information to libraries so that they can judge whether usage justifies subscription. Conversely many users do not wish anyone to know what they are reading or researching. Traditionally, libraries have preserved the anonymity of user data except where criminal acts are suspected. Is this a right or simply a custom?

Then there are a series of issues and old battlegrounds to revisit. Rights Management Systems are growing quickly and are promoted largely by commercial concerns. They provide many areas of philosophic contention. As mentioned above, the question of whether the user can remain anonymous conflicts with commercial need. Secondly, the issue of preservation remains technically, legally and operationally unresolved. Historically this has been the domain of the national libraries, but it is not clear that they will or can perform the same role in an electronic environment. We cannot reasonably expect preservation to be undertaken by publishers. And thirdly, the whole issue of fair use is being revisited by publishers, some of whom declare that it does not or cannot exist.
electronically. Major battles need to be undertaken on these issues, again with little evidence that the academy understands or cares about the issues.

The preservation and archiving of electronic information has barely surfaced as a very complex issue. The Data Archive at the University of Essex has existed for some thirty years and has perhaps as a clear a picture as anywhere of the so far intractable problems of storing, refreshing and kitemarking information. The problems are staggeringly complex technically and staggeringly expensive to resolve. Although some progress is being made on the legal deposit of commercial material, little appears to be done on the non-commercial and primary materials of scholarship. There are no standards or control or approval mechanisms for institutions or data repositories. This position may be compared with that in the United Kingdom where archives are expected to meet the BS5454 standard and the Historical Manuscripts Commission takes an active interest in the state of repositories and where archivists have specialist professional training. A new class of electronic material, what Clifford Lynch of CNI has called “endangered content” is emerging, where the formal and informal records of disciplines are effectively at risk through neglect. Archives collect papers, but institutions do not sample or preserve the electronic mail or word-processed files of their scholars. Lab books are routinely preserved by scientists, but it is doubtful if any institution has a policy for the preservation of digitally captured images or data from research equipment.
There is a creeping form of cybercolonialism in the assumption that only the United States has digital material of value to the world. A study of websites related to mathematics, a subject one might expect to be less language dependent than most, will show that American sites are always preferred to central European ones and that the great mathematical journal series from Charles University or the Jagellonian University are ignored. No discussion appears to take place of how the products and output of small learned societies are to be mirrored around the world and what standards and quality controls will apply to mirror sites. Again the scholarly community is silent while the commercial giants of the STM world dictate the shape of electronic scholarly communication – despite the fact that large scientific publishers are aberrant rather than the norm. King’s College has built up a premier collection of Portuguese African material over many years, but it is not clear how this will be maintained in an electronic environment, or how material will be mirrored in South America and in Europe.

A more positive element which is emerging in the electronic era is the broadening of what constitutes content. Services such as the Arts and Humanities Data Service\textsuperscript{9} based at King’s College London or the excellent SC Ran project\textsuperscript{10} funded by the museums of Scotland are much involved in the digitisation of museum and archive collections. This is happening fast.
and brings relevant experience in activities such as new licensing models and standards. It also highlights the role of curators in the digital environment as relating to presentation as well as preservation. But again there appears to be little concerted effort by the official organs of scholarship to build formal cross-domain linkages.

Network topology is barely discussed as an issue due to a naïve assumption that there will be an infinitely expanding amount of bandwidth, which will somehow be made available to scholarship. And yet there is no evidence to support this view. The network is not yet totally robust. A recent Dilbert cartoon pointedly and uncomfortably accurately suggested that all of the time saved through automation in the information age had been lost by people sitting at web browsers waiting for pages to load. Networks do not yet for example give the reliable quality of service required for multicasting, while video clips have all the power, quality and assurance of early silent films. It should be self-evident that for research institutions working at the leading edge of scholarship and indeed telecommunications, the standard services provided by Internet Service Providers will always be inadequate. It goes almost unremarked that for most of Europe, the United States is a virtual country in the afternoon, not least because of the assumption or the fact that resources are not spread around the Internet in helpful ways. American universities have abandoned the failing Internet provided by telecommunications companies to create Internet II as a private network
attuned to their needs. In Europe the relatively modest ambition of the European Union to link existing research networks through the TEN-34 Project has been “shaped by a series of non-technical influences such as non-availability of required public services”\textsuperscript{11}, while “standard PNO (public network operator) services in Europe could not fulfil the requirements of the R&D community in Europe”\textsuperscript{12}. Equally the assumption that we accept a simple commercial approach to network planning is questionable. At present in the UK, bandwidth is acquired in the light of use rather than as a result of scholarly or educational policy decisions. Thus bandwidth expands at a great rate to the East Coast of North America to meet traffic growth. There is almost no debate on whether policy should drive such acquisition and route bandwidth say to Southern Africa then India, Singapore, Australia and then the West Coast of the United States opening up markets and scholarship to what is sometimes called UK Higher Education Limited. A more strategic approach is possible. It is interesting to note the recent decision of the Australian Vice-Chancellors to use network charges to discriminate against overseas websites and in favour of Australian ones\textsuperscript{13}. It is of the nature of scholarship that it is both global and interested in the minor and apparently obscure. It is interested in the underdeveloped as well as the developed world. At the G7 Conference on the Information Society held in Brussels in 1995, Thabo Mbeki famously commented that were more telephones in Manhattan than in the whole of sub-Saharan Africa\textsuperscript{14}. For
the Academy to leave network planning entirely to commercial actors is to deny the global and universal nature of scholarship.

Although it has never been taken for granted that there is a guaranteed right of access to scholars to all printed information there has been an instant assumption that Internet access is part of the academic birthright. There has been no real debate on what is the appropriate model for information access in the electronic environment. At least conceptually the library provides an alternative model in which the intranet becomes the focal point for information access. Whether or not this model is workable is less important than that it attempts to construct a model for information access.

The last topic I want to cover is that of the global marketplace. A variety of threats has been posed from the Microsoft University to the Western Governors and Phoenix. These organisations are long on rhetoric and short on reality. They may be compared with the reality of, say, Clyde Virtual University in Glasgow, already delivering courses to thousands of students, but doing so over a Metropolitan Area Network. The reality of bandwidth provision means that the last mile is delivered at, at best 50kb to modems, while on the MAN the multi-megabyte provision allows multimedia products to be delivered. I believe passionately that the Academy, that groups such as this must begin to consider strategically what they need from an electronic network, that they need to consider social responsibility and
social inclusion or at the very least academic responsibility and academic inclusion. A world governed by commissioners such as Martin Bangemann who subordinate their principles to Spanish gold is not one that sits comfortably with the scientific and humanitarian endeavours of scholarship. And it is for that reason that I believe the threat from commerce to be overstated. One of the reasons that we work in universities is the belief that the pursuit of knowledge is an absolute good. I believe firmly that the role and position in society which this confers will not be seen as having a commercial alternative.

And so to conclude this meander through my prejudices, I should like to see us as a community creating a strategic vision and an agenda for change. There has, for example, been the stirrings of a debate in the United States as to whether we need to create two copyright systems, one for education and one for the entertainment industry. This is excellent but I think the wrong way round. I would wish to see serious debate on what we require from an electronic environment for scholarship, then set about constructing it. In particular I wish to see us consider how the minority subjects, languages and concerns which are the peculiar prerogative of the humanities are to be served by rather than dictated to by networks and how the products of small learned societies are to be made available wherever and whenever needed. Finally I think the academic community has to begin to look at how non-commercial products of scholarship are to be made
available and preserved or the future. And lest you think that I too am guilty of the empty rhetoric I have deplored the post of Digital Information Officer at Strathclyde, a post aimed at addressing these very issues, was filled at the start of this academic year.

I began with Disney so perhaps can be forgiven for concluding with Warner Brothers and what would be a breach of copyright if played rather than written or spoken. In the immortal words of Bugs Bunny, “That’s all Folks!”

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