

Intellectual Property Rights in the Academic and Research Environment

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Introduction

The concept of intellectual property rights, which in the academic and research context are mainly concerned with patents and copyrights, has served society well in nurturing the economic developments that have followed the industrial revolution. Broadly speaking they seek to maximise the public good derived from invention and creativity by protecting monopoly rights (for 20 years in case of patents but much longer in the case of copyright) to allow adequate rewards for the initiators, while ensuring that the benefits pass eventually into the public domain. There are normally extra safeguards which allow these rights to be over-ridden in extreme circumstances such as national security, and also, importantly in the academic sector, to allow limited use for teaching and research, so that new results and ideas can be passed on to provide the basis for further developments.

The importance of these intellectual property rights has increasingly impinged on the academic community in recent years for a number of reasons. The greater emphasis on wealth creation, even in academic research, has distorted the old norms of academic behaviour, so that everyone is now encouraged to consider the potential financial rewards that may be derived from their work. This can inhibit the freeflow of information about new developments, and reduce the benefits of the research to the community in general. For this reason it has been argued by some that the old concept of IPR is foreign to the academic research enterprise and that all knowledge, creativity and invention should be made freely available. While many scientists would support this concept, it is unfortunate that the philosophy behind the funding of universities and research currently adopted by Governments

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worldwide makes this a completely unattainable goal at the present time.

The problem therefore is not whether there should be intellectual property rights at all in this context but rather where the line should be drawn. The important difference between discovery and invention, or between scientific knowledge and its application, has become increasingly blurred as science has moved forward. In particular the emphasis on the 'knowledge society' and the commercial advantages conferred by knowledge in the services sector as opposed to patented inventions which are important in the manufacturing sector, has created pressures to award protective intellectual property rights to knowledge itself.

Academics, particularly scientists, are therefore faced with a serious dilemma. On the one hand they wish the results of their research to be widely available as their contribution to the forward march of their discipline, while at the same time they are being encouraged by their employers and funders to make sure that any potentially profitable inventions are retained and protected.

The enhanced protection for intellectual property rights and international agreements such as TRIPS (Trade-Related Aspects of Intellectual Property Rights) which improve their enforcement internationally has a disproportionate effect on poor and developing countries, who are effectively denied access to information (creating a so called digital divide) and to patented products. This has been highlighted by the recent high profile case relating to the cost of AIDS drugs in South Africa. The present situation reflects an uneasy compromise in which rights holders, publishers and drug companies, are making their material and products available at low prices, without conceding any principle in relation to their rights.¹

Patents

There is no doubt that the pressure to take out patents for research in the university sector has some distorting effect on the pattern of re-

¹ The Department for International Development in the UK has recently set up a Commission to study 'How IPRs could work better for developing countries and poor people' whose report can be found on website <http://www.iprcommission.org>

search, by targeting funds into areas which have some potential for immediate applicability as opposed to 'blue-sky' topics, although past experience shows that the really important breakthroughs tend to come from unexpected and serendipitous results. Röntgen was not looking for a medical diagnostic tool when he discovered X-rays, nor was Maxwell looking for radio communication when he derived his equations! This attitude also encourages a greater secrecy when it comes to divulging results and leads, at the very least, to delay in publication in some circumstances.

It has been argued that this rush into patents is also of doubtful value and certainly the vast majority of patents taken out produce no significant return to their owners. Researchers and their universities are unlikely to command the financial resources necessary for efficient exploitation of their ideas while this financial weakness makes them vulnerable to patent infringements, which can only be combated through time consuming and expensive litigation. Academics should be more selective when considering what should be patented. But for inventions of value the academic community would be more effective in this field if there was a simplification of the patent laws. In Europe there is not yet a community wide patent, although one is currently under discussion, and hence patents have to be pursued expensively in many jurisdictions. Moreover there are significant differences between the patent laws in Europe and in the United States, crucially over the difference between 'first to invent' and 'first to file'. This allows disclosure during their grace period in the US so that some preliminary publication of results does not invalidate the claim. The introduction of a grace period is currently under active discussion within the EU².

Probably the most pressing issue in relation to patenting lies in the biomedical sector with the boundary of patentability in DNA sequences where the line between discovery and invention has become blurred. Many thousands of patents which have reserved rights over these sequences have been granted to researchers across the public and private sector but the normal criteria of the inventiveness has been rather weakly applied. Many such patents make only vague and unsubstantiated suggestions when it comes to the potential utility of the material.

² For an account of recent consultancies pertaining to a possible grace period in Europe see:
http://europa.eu.int/comm/research/era/ipr_en.html
together with expert opinions at:
http://www.european-patent-office.org/news/pressrel/2000_07_25.e.htm

A recent discussion paper from the Nuffield Council in Bioethics *The Ethics of Patenting DNA* (July 2002, ISBN 1 904 384 02 1) argues that on the contrary it is in the public good for this test to be applied more vigorously so that work on the possible applications of the sequence information to research and medical practice can continue uninhibited. They foresee that in this case the number of future patents asserting rights over DNA sequences would become the exception rather than the norm. Moreover they recommend that product patents should be limited to the uses referred to in the claims and not as now allowed to cover all potential applications of the specific sequence. There are also difficulties where a patent based on a gene sequence creates an effective monopoly in a diagnostic test in a way that can inhibit further research in the area. The most high profile case to date refers to the BRCA1 gene and its role in diagnosing susceptibility to breast cancer. In this case several French organisations together with the Belgian and Dutch Ministries of Health have filed opposition to extension of the patent. What is needed is a better international consensus of the appropriate limits for patenting related to DNA sequences, which restores the traditional balance between discovery and invention.

Copyright and database rights

In the area of copyright and related rights there have been a number of changes in the attitude to publications from everyone involved in the scientific information chain; authors, publishers, librarians and users, as well as in the underlying legislative framework, in response to the impact of the new technologies. Electronic publishing is now common in the sciences³.

It brings with it great advantages in speed of dissemination, improved indexing and cross referencing, and some reduction in cost. But the increased ease of copying, which would not greatly concern scientific authors of journal articles, though it would for textbook authors and musical composers, certainly represents a threat to the investment

³ For extensive discussion of the impact of electronic publishing in science see the proceedings of two joint ICSU / UNESCO Conferences on the subject in 1996 and 2001 to be found on the ICSU Press website:
<http://associnst.ox.ac.uk/~icsuinfo/ConfProc.htm>
<http://associnst.ox.ac.uk/~icsuinfo/confer01.htm>

made by the publisher. As a result there have been several attempts to tighten the law covering copyright and in particular to dilute the traditional fair use exceptions which allow the copying of copyright material for private study, teaching and research. The familiar arrangements under the old copyright regimes work satisfactorily and the Academies, amongst others, have been pressing legislators to try and ensure that a similar balance is maintained in the electronic environment.

One consequence of the relative ease of electronic publication has been an increase in self-publication on the authors own web site, and the posting of material onto preprint servers. Although this material may not have the benefit of peer review it is an effective way of informing colleagues of the latest developments. Even for material appearing in traditional journals it has also generated pressures from grass roots scientists to try to force the publishers involved to make their material available free after a certain time interval. The initiatives of the Public Library of Science and the Open Society Institute⁴ have not yet been successful but they do indicate a significant trend in scientific opinion. The key to further developments is likely to lie with the learned societies which still play a dominant role in academic journal publishing but who also make significant profits from this activity which they find it difficult to forego.

The legislative pressures have been most concentrated in the area of database protection and derive from the European Directive on this matter. This created a new 'sui generis' right giving the equivalent of copyright to the contents of databases which were judged insufficiently creative to qualify for *droit d'auteur* in the national jurisdictions of most countries of the EU. In so doing the legislation created IPR in the data themselves, something which is explicitly not covered by traditional copyright legislation. Hence if strictly applied it will greatly inhibit the extraction and re-use of data by scientists from these databases. It also encourages creators of data, even those in the public sector such as meteorological and oceanographic services, to put a value on their data which has traditionally been made freely available as a public service. Although the legislation was framed with the media industries in mind and current infringements before the courts relate to data of short term value such as stockmarket prices, real estate portfolios, and horseracing

⁴ <http://www.publiclibraryofscience.com>
<http://www.soros.org/openaccess>

lists, it does not provide the exceptions for education and research which are traditionally found elsewhere. This legislation is currently under review and ALLEA together with other academies have been pressing for modifications which would make it more friendly to the academic community⁵. The outcome is far from clear, as is the prospect of similar legislation in the USA and Japan where these matters are still under review.

Conclusion

Thus there is a general trend towards creating an intellectual property right in knowledge and in moving the boundary between discovery and invention and between knowledge and its application, to a point where the traditional freedom of sharing the results of research openly with colleagues in a universal support of the scientific endeavour is becoming seriously threatened. Although there have been a few spectacular winners among individual academics and their institutions from patents and copyrights, it is doubtful whether the system as a whole, or the public in general, has benefited from the greater emphasis on wealth creation at the expense of service to the community. Academics need to be vigilant against any further erosion of academic norms, and against the efforts of governments, funding agencies and facilitators like publishers, to tighten the legislative framework to the detriment of the academic enterprise.

⁵ For discussion and recommendations relating to the impact of the Database legislation on full and open access to scientific data see the CODATA website:
http://www.codata.org/data_access