Learned Publishing (2005)**18**, 91–94

Who owns scientific data? The impact of intellectual property rights on the scientific publication chain

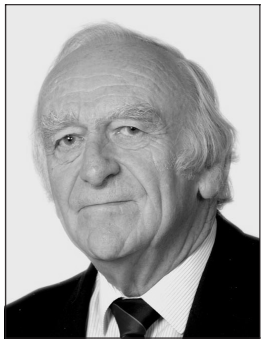
Roger Elliott
University of Oxford

ABSTRACT: Intellectual property rights have become increasingly important in scientific research. As the legal regime has been tightened and attitudes of funders, employers and researchers have changed, serious challenges are emerging to the free flow of ideas and information on which the scientific enterprise rests. It is important that individual scientists are aware of their rights and convinced to use them in the public good.

Introduction

The concept of intellectual property rights (IPRs), which in the academic and research context are mainly concerned with patents and copyrights, has broadly speaking served society well. Such rights stimulate innovation by protecting creative work and investment and by encouraging the ordered exploitation of scientific discoveries for the good of society. In general they seek to maximize the public good by protecting monopoly rights for a finite period to allow adequate reward for initiators, while ensuring that the benefits pass eventually into the public domain. But although IPRs can aid the conversion of good science into tangible benefits, the fact that they are monopolies can cause a tension between private profit and public good. If the balance between these is not correctly set, IPRs can hinder the free exchange of ideas and information on which science thrives. There is strong evidence that this balance has shifted in recent years due to social and economic pressures on the one hand and to changes in technologies on the other, in ways that threaten the well-being of the scientific enterprise.

The importance of IPRs has increasingly impinged on the academic community in recent years for a number of reasons. A 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 which may be derived from their work. This pressure can come from the funding agencies because governments seek immediate returns, from universities and other employers who are encouraged to look for funding outside the traditional state grants, and the academics themselves who are tempted by monetary rewards beyond those derived from professional recognition. The focus on research



Sir Roger Elliott

which leads directly to IPRs is likely to damage the health of science in the longer term. Moreover evidence shows that, while there are a few big wins, most academic institutions draw little financial benefit from the exploitation of IPRs. These issues have been broadly addressed by the Royal Society in a report called 'Keeping Science Open: The Effects of Intellectual Property Policy on the Conduct of Science' which can be found at their website (www.royalsoc.ac.uk).

As a result there is an increasing perception in some quarters, derived from the idea of the 'knowledge society' and 'knowledge economy' that information such as scientific facts should be regarded as a commodity with monetary value. This runs counter to the traditional argument that publicly funded research, particularly in universities, should be driven by the general spirit of enquiry, and based on the merit of the work from the point of view of science, rather than its potential for short-term exploitation. If IPRs exist in the scientific information which results from research, then serious questions arise as to who owns them.

some research where there is a clear public interest has been inhibited by the IPR discussion

The legal framework governing IPRs has been strengthened in recent years in a number of ways, usually by strengthening monopoly rights, e.g. by restriction of exceptions, in the face of perceived threats to the rights holders from new technologies.

In this paper the difficulties that arise in the three areas of patents, copyrights and databases will be briefly considered.

Patents

There has been a creeping tendency in recent years towards pushing the boundaries of patents across that ill-defined line between discovery and invention. The three major requirements of novelty, inventive step or non-obviousness, and utility remain, but they have been applied less rigorously in many jurisdictions. There is, for example, a real question whether scientific facts such as a DNA genome sequence meet such criteria particularly when the utility in practical terms is ill-defined and distant. Moreover, the exceptions for 'private and non-commercial' and 'experimental' use have been eroded. Although some steps are now being taken to correct these anomalies, there is strong evidence that some research where there is a clear public interest has been inhibited by the IPR discussion.

There are also difficulties which arise because of the different nature of patent legislation in different jurisdictions. There are particular difficulties in Europe because the many national jurisdictions have not yet been fully harmonized on this issue. There are also significant differences between Europe, which uses a 'first to file' system under which any prior disclosure, e.g. by publication or lecture, can negate the claim; and on the other hand the US 'first to invent' system which allows a period of grace during which prior disclosure is allowed. Thus the European system must clearly delay publication of relevant material to the detriment of related research. There is support on both sides of the Atlantic for a system that would combine a grace period with the clarity of the 'first to file' procedure but such negotiations will take time.

Copyright

Copyright grants exclusive rights to creators of original literary, scientific and artistic works with extensions to computer programs and databases. It protects the form of the expression of ideas, but not the idea, information or concept expressed. The established paradigm, codified in the Berne Convention, has worked well for a century for the written and printed word but changes in technology have given rise to increasing tensions in recent years. The relative ease of electronic storage and transmission has made copying and dissemination easy and cheap, and in so doing has threatened the economic returns to the author and the publisher. The reaction has been to tighten copyright laws in a number of ways which have had significant consequences, not all of them intended, on the academic and scientific sectors.

Copyright always initially resides with the author unless it is overridden by the contract of employment. In the academic world universities have traditionally either explicitly or implicitly waived any rights they might

have, leaving these for articles, monographs and textbooks with the academics themselves. With the advent of distance learning there is a potential conflict of interest in teaching material which clearly derives from employment.

A much larger area of conflict has developed in the treatment of scientific information.

The traditional vehicle for transmission of the results of research is through learned journals where the established pattern has been for the publisher to require transferral of copyright in exchange for the value added through quality control and distribution of the printed material.

This has been accepted by scientists in the past since they seek only the widest possible dissemination of their material and ideas and do not expect direct monetary reward, which comes through career enhancement. Some publishers have in recent years driven a hard bargain and taken what have appeared to be excessive profits for providing this service. With the almost universal acceptance of electronic publishing for this material a debate has arisen as to whether the author and user community, which are in fact the same, might not take back control of this chain with more limited intervention by publishers and librarians. Several alternative models, such as the Open Access Initiative, discussed elsewhere, are now being considered.

The situation is exacerbated from the scientists' point of view by a tightening of the laws relating to 'fair use', certainly in Europe, to meet the enhanced threat of illegal copying and dissemination. The traditional ability, enshrined in the Berne Convention, to copy and reuse a limited amount of material for 'private study and research' has been replaced in European Directives by an optional exception to allow limited copying 'where there is use for the sole purpose of illustration for teaching or scientific research as long as the source is indicated and to the extent justified by the non-commercial purpose to be achieved'. Moreover some interpretations of the new law allow for even this 'fair use' to be overridden by contract and by technical measures.

Databases

Databases, collections of data organized in a systematic way, play an important role in scientific research. While they were traditionally found in books such as encyclopaedias, digitization and the potential for low-cost global communication has opened up tremendous opportunities for their dissemination and use. While the common-law tradition of the US and the UK gave copyright protection for such work through the 'sweat of the brow' investment, providing a certain level of creativity was met, in most continental European jurisdictions the concept of *droit d'auteur* required a higher level of creativity than many compilations enjoyed and thus the EU has introduced a new *sui generis* right to extend a protection similar to copyright for databases. However, with the commercial sector in mind (court cases to date have been concerned with lists of things like horse race runners, real estate property and market prices), the legislation was drawn tightly in a way that is very inimical to science and its traditional method of working. In the first place the law gives protection to the data themselves (which is not covered by copyright) and forbids their extraction and reuse without permission of the rights holder. Moreover that person is the creator of the database and not the creator of the data themselves; a procedure that in science is infinitely more expensive than creating the database. Thus the law has a potential for preventing easy access to expensive data without payment to a self-appointed gatekeeper. Furthermore the fair use provisions are unduly restrictive. As with the copyright issues discussed above, the remedy would appear to lie within the scientific community, which should strive to keep key databases within the public domain as for example happened with the HUGO project in relation to the human genome data. This will require the funding agencies to understand that the full potential of expensive research will not be realized unless its effective dissemination is also funded.

the scientific community should strive to keep key databases within the public domain

There is a slight hope that the EU Database Legislation which is currently under review will be amended to address these

concerns. It is notable that the US and Japan have not developed similar legislation, partly because of the strong pressures exerted by the scientific community in the US. It is regrettable that the European scientific community has not been so effective in explaining the special status required for data and information if the scientific research enterprise is to flourish in the general public interest.

Conclusion

The net effect of the changes in intellectual property legislation, and in the changes in social attitudes towards IPR, has been to give greater emphasis to the ownership of these rights within the scientific community. The legislation, which was normally framed with commercial interests in mind, favours a commercial view of scientific data and its use. This has a real potential for inhibiting that free flow of information which is essential for scientific research to flourish. In order to protect scientific research as a communal enterprise, individual scientists have to be aware of their rights, and convinced to use them for the general good.

Acknowlegements

This paper was originally presented on 26 August 2004 to the session 'Spreading the Word: Who Profits from Scientific Publishing?' at the EuroScience Open Forum in Stockholm.

Roger Elliott
Department of Theoretical Physics
University of Oxford
Oxford, UK
Email: r.elliott1@physics.ox.ac.uk