

Forum: Ethical Implications of Patenting Academic Research  
European Centre for Ethics, Catholic University Luevan  
Brussels Foundation, 22<sup>nd</sup> November 2005

## **‘The Global Information Society: Patents and Universities’**

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There is widespread conception that we have entered a ‘new age’; an age patterned by the deployment and use of information and knowledge, rather than dominated by the utilisation of physical resources. These claims are certainly not unfounded, and we can easily identify the increasingly information saturated character of (global) society. However, while it is clear that this represents a major shift in the form of social relations across the world (although the effects of informationalisation are far from universal/global and are clearly subject to considerable wealth effects), as I have argued elsewhere, it is less obvious that this represents a major change in the substance of (global) society itself (May 2002). This observation is prompted by the major and continuing role that is played by intellectual property in the political economy of the (so-called) information society. Indeed, we might say that the intellectual property is the legal form *of* the global information society, because the information society’s key resources are owned (and expressed) as intellectual properties. Therefore it should be no surprise that universities across the world have found themselves increasingly either required, or strongly encouraged, to examine the manner in which (as knowledge ‘creating’ institutions) they interact with the system of intellectual property rights (IPRs).

Certainly, when universities were broadly research only institutions they mostly were ignored by (corporate) patent owners, and universities themselves often ignored the market application of innovations produced within their various departments. For corporations this was partly because in many jurisdictions something similar to the US experimental use exception obtains (in one form or another), and partly as the infringements were unlikely to impact on the commercial markets patent holders operated in (indeed formally infringing experimentation often provided commercial benefits when new uses or applications were discovered for already existing technologies or processes). For universities, the suggestion that they rather than other, commercial, actors should seek to control and profit from the results of research was hardly entertained at all, not least of all as in many cases these institutions jealously guarded their relative disconnectedness from the market.

However, two political economic shifts have transformed this situation, and the previous benign neglect of intellectual property in universities is less and less likely to be ignored by corporations or policy makers now or in the future. On the commercial side, the increased share of value-added in many products has focussed corporate managers on the issue of the ownership and exploitation of knowledge and information. This has led to an expanded interest in IPRs, both internally (related to the ownership and exploitation of specific intellectual properties – including trademarks, copyrights *and* patents) and externally (with corporations playing a major

role in the negotiations that led to the Trade Related Aspects of Intellectual Property Rights – TRIPs – agreement at the World Trade Organisation – see May and Sell 2005: chapter seven). Corporations increasingly regard the ownership of the information or knowledge incorporated into their goods and services as a key issue and thus seek to establish its commodity status by rendering such elements as intellectual property subject to their exclusive control and ownership.

On the other side, Universities have themselves have been suffering varying, and in some cases quite extensive, pressure as regards their publicly funded budgets. Thus, in many developed and developing countries, encouraged by their own governments, and in the case of developing countries by international financial institutions, many universities have started to examine new ways of capitalising on their activities through the market. Among other possibilities, this has involved programmes of ‘spinning off’ companies to exploit specific advances made by university staff, as well as a much more activity in licensing to commercial organisations (Monotti and Ricketson 2003: 216/7). Thus, as Universities have moved into commercial markets themselves, and perhaps most importantly have started to both assert their own patent rights, as well as exploit them for gain, their previous lack of concern and interest in the ownership of intellectual properties has started to swiftly evaporate. This dynamic has been evident across many realms of knowledge, from information and communications technologies (ICTs) to the work universities conduct in various areas of science. Thus, the difficulty is that many universities find themselves torn between a norm of scientific community (and therefore the sharing of advances) and the requirements to utilise their research-related resources as sources of income.

As Rebecca Eisenberg puts it: ‘Institutions tend to be high-minded about the importance of unfettered access to the research tools they want to acquire from others, but no institution is willing to share freely the materials and discoveries from which they derive significant competitive advantage’ (Eisenberg 2001: 228). Certainly this may lead to hybrid agreements that allow some circulation of tools for non-commercial experimentation among communities of scientists (running in parallel with the experimental exception for patents), while it has also led to some frustration among university scientists finding budgets being eaten up by licence payments. Taking biotechnology as an example; although two fundamental biotechnological advances (the Cohen-Boyer patent on recombinant DNA and the patent on polymerase chain reactions) were both widely licensed on favourable terms (by Stanford University and the University California, in the former case, and Hoffman-La Roche in the latter), such practices have not been widely followed, and indeed the logic of licensing has moved in rather the opposite direction (Eisenberg 2001: 230). Indeed this shift may undermine new or emergent research based industries that might expect to follow the biotech path; the accelerated success of the biotechnology industry was in a large part based on its original (and now far from common) openness as regards potentially profitable intellectual property.

More generally, this suggests, the Bayh-Dole Act of 1980 was of profound importance for American publicly funded research. By giving Universities the right to retain title to and licence inventions which stemmed from federally funded research, research based institutions could (and did) develop and maintain strong patenting strategies (Maskus 2000: 202). Although not as developed, a similar tendency has also become apparent in European universities, not least of all as even the most well funded public institutions have been struggling with the need to find ways to increase their income. Given the pressure across the world on governments (a political culture that

increasingly demands the paradoxical combination of lower taxes *and* better public provision), no university is able to ignore the potential earning capacity that the commodification into IPRs of its research work can deliver.

### *The problem in general terms*

As the trade applicability of various aspects of 'pure' science has become more obvious so more science has become 'trade related', and thus open to the pressure to be made property, the pressure towards commodification. Within this widening of what can actually be rendered as intellectual property (the expansion of patent scope) there is implicitly a moment when something that has previously (potentially) been in the public domain (as non-ownable knowledge) is re-coded as 'trade-related' and thus amenable to the 'protection' afforded other *trade-related* (intellectual) property; the moment when its trade-relatedness is asserted. What might once have been public or commonly 'owned' is rendered trade-related and thus private; it is commodified.

Trade relatedness itself is often presented as both common-sense and unproblematic. However, the line between public and private knowledge, is subject to constant reconstruction through the reformulation of the concept of 'tradable' knowledge working in conjunction with changes of technologies that can utilise it. Therefore, although the form of the distinction remains fixed, as a binary division between non-tradable knowledge and tradable knowledge, the content of each sector varies with the development of technologies that enable the capture of, and profiting from, different types of informational item or knowledge object (May and Sell 2005). Equally, shifts in what might be intellectual property drive new attempts to capture attendant rights through the claim for trade-relatedness, what we can perhaps more simply refer to as commodification. This then suggests that the most important role that IPRs play generally is the formal construction of scarcity (related to knowledge and information use) where none necessarily exists, nor previously existed.

Therefore, it is important to remember that even material property in a legal sense can only be what the law says it is, it does not exist waiting to be recognised as such, but rather is the codification of particular social relations, those between owner and non-owner, reproduced as (property) rights. Indeed, Walter Hamilton once remarked that it has always been 'incorrect to say that the judiciary protected property; rather they called that property to which they accorded protection' (quoted in Cribbet 1986: 4). But, whereas material property rights merely codify the existing materiality of things (and their relations of possession), IPRs transform the existence of that which they encompass. There is an important difference between property in knowledge and information, and material property. As Arnold Plant put it, unlike 'real' property rights, patents (and other IPRs)

are not a *consequence* of scarcity. They are the deliberate creation of statute law; and, whereas in general the institution of private property makes for the preservation of scarce goods, tending (as we might somewhat loosely say) to lead us 'to make the most of them', property rights in patents and copyright make possible the *creation* of scarcity of the products appropriated which could not otherwise be maintained. Whereas we might expect the public action concerning private property would normally be directed at the prevention of the raising of prices, in these cases the object of the legislation is to confer the power of raising prices by enabling the creation of scarcity (Plant 1934: 31).

This protection of rights for the express purpose of raising prices is, of course, central to the 'problem' of commodification of science and other public research outputs in the universities.

Again, taking the biotechnology industry as an example; one of the key processes that prompted the commodification of bio-medical science was the recognition by a number of groups (venture capitalists and multinational corporations most importantly) that the fruits of such research could be the basis of a new industry. This transformation of bio-medical science into the biotechnological industry, was and is the transformation of science into technology (Kenney 1998: 141). Patenting can only be formally achieved for industrial technologies, hence the narrative of trade-relatedness and the narrative of technology meet in establishment of the ability to patent the fruits of bio-medical science; the result can only be achieved by the rendering of science as technology, the shift from scientific endeavour to commercial industrialisation of the sector.

Moreover, as James Boyle has pointed out, the establishment of the industry (and its reliance on patents for its continuing operation in its current form and character) is often taken as an important argument (whatever other considerations may be brought to the debate) for the justification of biotechnological patents – without them an important industrial sector would fail (Boyle 2003: 13). Thus, the social role of patents moves from supporting innovation, to supporting commercialisation. In this sense, patenting's role in industrial organisation is an important element in the policy issues that surround the relationship between universities and intellectual property. And, of course, this problem is not limited to biotechnology or even only science; rather the general problem of patents for universities is that as organisations they are caught between two conflicting social demands – the need to develop and express knowledge and information as a public-regarding service; and the need to support economic development to underpin expanded social welfare (within capitalist social relations).

### *Universities and patents: caught in a cleft stick?*

The relationship between the universities as developers of scientific (and other) advances, and the role of various linked industrial sectors as commercialisers of these advances has been changed both by the shift in the manner in which IPRs can be deployed in science-linked sectors, and by the demands being made more generally for publicly funded universities to exploit their resources to make them less dependent on tax-derived funds. Thus, there are two (essentially) conflicting models for universities in the new millennium. This is not to say that one university could not adopt both these models simultaneously, only that each involves a different organisational logic, and these logics undermine each other.

The mobilisation of a property logic renders information and knowledge as separable modules that can be bought and sold, rather than as part of a complex and multifaceted resource. Indeed, by rendering knowledge and information as property their organic socially-embedded character is denied and each 'property' is rendered as a technical resource that can either be deployed (traded) or not (depending on whether a price has been paid). This can have a severe wealth effects (as has been demonstrated by the issue of access to patent-protected AIDS medicines in developing countries), and as such often places the rights of 'owners' to receive payment above the rights of those who may need informational or knowledge-related products to use

them, but do not have the wealth to pay for them. Socially disembodied knowledge becomes subject to the power to withhold access (a key property right) and thus forms an integral element of political economic power in an information society. Knowledge that is compartmentalised into units can be controlled separately, and thus power over users can be expanded by limiting contracted uses. The social disembodiment of knowledge and information often leads to under-use as flows are constrained by market transactions (they are no longer free – both in monetary terms and in the sense of being unrestricted).

The difficulty is that if universities fail to commodify their own research, then external commercial interests are able to exploit this research to garner returns that the universities themselves might enviously regard as being derived from their staff's own work and effort. However, as many industrial and/or scientific organisations utilise (now) patented technologies or processes in their own research as inputs, it is not necessarily clear that all private interests necessarily would want to support widened patentability (Landes and Posner 2004: 15). Widened patenting increases the input costs for organisations that seek to deploy such technologies/innovations in their related research and/or commercial activities. Interestingly, despite the theoretical possibility that private corporate interests should actually seek to establish limits to the scope of patentability (and intellectual property more generally), the real history of IPRs has seen those representing the corporate interest push for an ever widened scope of patents (and more comprehensive copyrights) (May and Sell 2005). Thus, while certainly corporations have utilised intellectual property as inputs, in most cases the advantages of establishing protection for their outputs has outweighed any interest in seeking cheaper (non-commodified) inputs. Cost reductions *are* obtained by using inputs from outside the property system itself however, such as indigenous/traditional knowledge and expression, or non-commodified bio-inputs, often termed by critics, 'bio-piracy'. More generally, however, the post-production control issue is more important than the pre-production input-cost issue.

Moreover, the ability to have an exclusive right over specified inputs can itself be regarded as a key competitive advantage for the individual company. Indeed, one recent study suggests that the expansion of university patenting has led to a narrowed field of corporate use of innovations from publicly funded research, and also (and relatedly) a slower take up of these innovations more widely across industrial sectors. The use of licensing by universities (as well as their own start-ups) has disadvantaged some companies, while the favoured (or more well resourced) corporate partners of universities have gained early access to research (Markiewicz 2004). It is likely that such access to research also allowed these favoured companies to establish market advantage.

This then leads us to the other manner in which universities might regard their role in the information society. Adopting a more open logic, universities' managers might be prompted by non-commercial concerns to regard themselves as providers of innovations and knowledge to a public domain (the MIT OpenCourseWare pilot project is a good example of the way this logic can produce specific actions by universities). In this sense commercial operators might well be able to utilise such knowledge for commercial activities, but they would not be able to exclusively own these (knowledge) inputs. To some extent the clash of these two cultures was evident in the race to develop a map of the human genome and the subsequent successful (free access) publication of the complex of information related to the genome (discussed in May 2004). In many areas of university research the notion of openness is starting to

be taken up, and most obviously has been articulated through the use of open access publications (see May 2005), reflecting the movement in the sciences to open-access dissemination of research results.

In this vision of the universities' relationship with commodification through intellectual property, ensuring that basic research is available in the public domain halts and constrains the ability of commercial actors to enclose (which is to say commodify) the basic building blocks of scientific, and other advances. This idea of 'openness' draws on developments in software: a key issue for open source software advocates is the liberty to access the source code of software (its underlying architecture), with the connected freedoms to copy, modify and distribute/share software with others. Supporters of open source argue that treating software's source code as property obstructs co-operative working between developers and constrains or even halts subsequent improvements (de-bugging). However, it is important to distinguish between how 'open' is used in software development and how it is deployed in discussions of the dissemination of academic (and other) research.

For software, 'open source' development is a process related phenomenon; it concerns the manner in which development is organised as much as the products of such development. 'Open access' research in the university sector has no necessary impact on how research itself is organised (although, of course *it could*). While both ideas reject the commodification of knowledge and information, the outcome of rejection is different. In software development 'openness' provokes a wide ranging reorganisation of working, while in universities, access concerns predominate. The key issue for universities is the social value of free dissemination of scholarly knowledge, even if this is driven by the same *political* logic as the campaign for open source software. Such free access still allows corporations to achieve profitability through organisation and commercialisation, but not through the monopoly control of important inputs.

The difficulty of the open access approach to university research is that it requires either the government or other funders to support research with no expectation that the universities will make money from its exploitation. The university here is seen as a socially embedded institution, supporting the public domain of knowledge for the good of society. While this is a good story, as Ann Monotti and Sam Ricketson have pointed out, in the past universities actually mostly disregarded any positive dissemination that such a (political) position might imply. They may not have commodified the knowledge and information developed within the academy, but they also did little to actually communicate it widely or freely (Monotti and Ricketson 2003: 44). Thus, on the one hand, for many academics this is the model of scholarly openness that has been a clear part of their self-identity for centuries, but on the other hand it did little to prompt significant communicative action. The protection of this previously rather ambivalently regarded self-identity is now driving organisations like the UK's Royal Society to campaign to ensure that science remains open to free access by all those who seek to utilise research insights for further work and innovation (Royal Society 2003), but the threat is rather still seen as a question of access. The idea that universities might actually positively support dissemination of their work is relatively underplayed.

### ***What future for the humanistic university?***

Having explored some of the problems with the recognition of intellectual property in universities' research, the essential question remains: does commodification fatally

undermine the universities' humanistic project? Are the concerns relating to access to research so important as to render any defence of patenting (or other forms of commodification) of university research merely the articulation of a specific set of external commercial interests. Monotti and Ricketson's major study of the relationship between universities and intellectual property concluded that there remain sufficient checks and balances within the intellectual property system to allow universities to utilise its various forms without fatally undermining their own mission as regards the dissemination of information and knowledge, as well as their educational functions (Monotti and Ricketson 2003: 546). However, for Monotti and Ricketson, the commercialisation of universities seems to be an inevitable development and thus their approach (merely) seeks to enable universities to accommodate this shift in organisational logic.

While they are right that historically the intellectual property system has been able to settle (and at times modify) a relatively legitimated balance between the rights of individual owners and the public-regarding benefits of public availability (as explored at length in May and Sell 2005), it is also the case that increasingly the public aspect of the balance is regarded as a residual, what is left when all conceivable private rights have been exploited. As already noted, in the past the public-regarding aspect of knowledge that was accounted for by the university sector may have been treated relatively ambivalently by universities themselves. However, this does not mean that it is now necessary to bow before the ever more loudly celebrated logic of commodification. Rather, the shift to commercialisation of the fruits of university research might also raise the possibility of not merely articulating the humanistic notion of a socially embedded university, but also its more robust defence alongside an enactment of more active dissemination strategies. In many ways the commercialisation of university research is an attack on the public domain (the very sphere that intellectual property is meant to include within its institutionalised balance between private and public), and universities should be at the forefront of its defence.

However as James Robert Brown has pointed out these trends are far from universal across all university research areas: 'Profit-driven medical research in the United States is top-notch. Is it the huge profits that make it so? Pure mathematical research in the United States is also top notch, but publicly funded' (Brown 2000). The key difference is the possibility of commercial exploitation in the former but not the latter. This suggests that far from an inevitable process of change, the question of intellectual property is linked to the interests, not of universities but rather of external corporate actors. Where mathematical work has been utilised in software and ICT-driven commerce, there have been attempts to develop strategies for commodification (such as the voracious debates over software patents, for instance). These have not reached back into the actual mathematical processes themselves as these have always been explicitly excluded from patenting, although the open source movement suggests that even the shorter reach of commodification into software is unwarranted. The more general problem is that technology has introduced new possibilities for commerce, and the basic science building blocks that could be utilised in areas such as biotechnology have not been sufficiently excluded from legislative settlements in the realm of law. However, this is not to say they could not be, but the political economic interests arrayed against the narrowing of the scope of patents are extensive and powerful.

One arena where this is currently being played out is a the World Intellectual Property Organisation's negotiations to finalise the Substantive Patent Law Treaty (SPLT),

intended to encompass rules regarding the scope of patent (their subject matter), exclusions and rules for deciding between competing claims. The key elements that are to be harmonised by the SPLT (if an agreement can be reached) are: the establishment of patentability (to limit or remove national interpretations of the criteria for recognising a qualifying invention); the determination of the characteristics of an 'invention' for the purpose of patenting (to remove the 'technical' aspect, expanding the scope of patents to include, for instance, 'business methods', software and 'research tools' such as Expressed Sequence Tags in genomics); and the scope of patent protection (to reduce the possibility of using environmental or public health criteria for limiting grants otherwise covered by patent criteria).

The SPLT is intended to set a clear limit on any further limitations that national legislatures might regard as a political response to local problems and issues. If the SPLT was to be ratified, for those states that signed, governments' ability to shape their patent law to their specific circumstances will be further circumscribed (and if gets to this stage significant bilateral pressure surely will be applied to ensure accession). Conversely, the evident difficulty of finalising a text of the SPLT itself may indicate that at least currently universities still have some room to manoeuvre, and this may be the time to launch a set of practical actions demonstrating the political alternative to commodification.

However, the political forces ranged against the public domain are significant, and the logic of commodification is widely supported as a clear strategy for supporting the efficient use of resources (here knowledge and information). It will not be enough for universities to stress the need for a public domain of scientific endeavour (although the arguments about the constraints that patenting has put on science may be useful element to any set of political arguments about commodification), rather, the universities need to better articulate and practice their role as 'open' knowledge 'creators'. Interestingly, as already briefly discussed, this sort of practical critique of aspects of the contemporary intellectual property system has already emerged in a university-related sphere – the realm of software development (May 2005). Here, intellectual property has not been necessarily rejected, but rather its scope has been questioned and limited to those aspects where the open software community can see clear social benefits.

The future of intellectual property in universities might benefit from a careful examination of the manner in which the open source/free software movement has engaged with the notion of intellectual property (alongside other 'open' responses to commodification – see Mulgan, Steinberg and Salem 2005). What this suggests is that universities will have to entertain two contrasting logics to commodification in their overall practices: in some areas they may maintain robust intellectual property rights (perhaps over marketing materials, their 'brand' and perhaps some course materials), while also opening up other aspects of their work to open access. The debates in the software sector and elsewhere will offer guidance on how this trick can be pulled off. Although universities are unlikely to find their budgetary situations becoming better in the near future, equally to lose sight of their social role in providing the development of, and access to, socially important innovations must not be lost sight of. To downplay the social value of universities will be to lose hope for ever of re-establishing universities' non-commercial role.

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