

experience of free or virtually free public education. I agree with Watts that we need a new model of the university in order to retain spaces for public scholarship, rational debate and dissent.

Rob Watts is to be commended for reminding us how we have been seduced by market-crazed governance. His critique prompts us to rise above such governance rather than unquestioningly accept its fictions. Ever-increasing fees serve to encourage a focus on vocationalism, applied knowledge and credentialism, which is, after all, the rationale of the neoliberal state. I cannot see the clock being turned back to enable universities to engage in the noble aims of pursuing fundamental human goods, such as justice and truth (p.351), but as academics we should at least question cant and hypocrisy.

It is disappointing to see many typographical errors in such a rigorous critique. I cannot refrain from observing that La Trobe University, the author's own *alma mater*, is misspelled three times in the Preface. One would have thought that careful proofreading would be obligatory in a monograph in a series devoted to critiquing the university.

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Patent pledges: global perspectives on patent law's private ordering frontier,

edited by Jorge Contreras and Meredith Jacob, Edward Elgar, Cheltenham, UK, 2017, 343 pp., £100 (hardback) ISBN 9781785362484

This book deals with a comparatively new development in the use of patents by which firms voluntarily give up some of their exclusive rights through what are known as 'patent pledges'. It is a comprehensive and thorough work, but since its subject matter is not generally familiar it must be reviewed within the general context of patent protection.

Outside the chemical industries, for which it is effective, the patent system can no longer be taken seriously as a means of providing incentives for the kinds of technological innovation the world so desperately needs. In fact, the economic value of the incentives it currently provides is now much less than that of what has become its main use, which is tax avoidance and evasion

through transfer pricing. Royalties on intellectual property held in a low- or no-tax country can be adjusted to match profits in an associated company in another country so as to leave little or no profit to be taxed there. We know from EU figures, for example, that this has allowed Apple to pay only 0.005% on billions of profits, and this procedure is typical of multinational business operations (European Commission, 2016).

We also know from empirical research that two-thirds of worldwide profits attributable to patents accrue to the chemical industries, leaving only the remaining third for *all other industries combined* (Bessen and Meurer, 2008, p. 109). This is hardly surprising, since the modern patent law everywhere is essentially the United States act of 1952, which was ‘written basically by lawyers for the pharmaceutical industry’ (Judge Rich as quoted in Witherspoon, 1978, section 109). Neither is it surprising that there should be a growing movement to abolish patents altogether. Boldrin and Levine (2008, p. 264) claim that not just patents but all intellectual property is a ‘cancer’ and conclude that there is no option ‘but to set as a goal its complete elimination.’ Their view is endorsed by Mason (2015). We have been here before: in the nineteenth century in England, an anti-patent movement almost succeeded in suppressing patents (Machlup and Penrose, 1950).

Patents purport to protect invention, when what really needs protection is innovation, the turning of an invention’s information into reality. But because patents are granted only for invention, whatever protection an innovation receives from a patent is indirect, dependent on the strength of the link between it and its related invention. In the case of chemicals, this link is strong because what is bought and used at the end of the chain is identical to what was discovered in the laboratory and patented. Indeed, for a pharmaceutical product any difference would be illegal. But between a mechanical invention and its eventual commercial embodiment, the same link is very weak. There may have been so many incremental changes that one end is virtually unrecognisable from the other. Compare Chester Carlson’s original 1942 US patent for plain-paper copying with the Xerox 914 machine that became its classical embodiment.

Therefore, the strictly defined monopoly the patent system purports to grant – ‘exclusive rights for limited times,’ as article 1.8 of the US Constitution puts it – does not suit non-chemical technologies. In these, information resulting from R&D will be capable of being developed along several different trajectories, but the monopoly grant can prevent this. Boulton and Watt’s patent for the separate condenser stymied those who wished to use high pressure steam (which was the future) instead of the low pressure that Watt favoured. The determination and skill with which the Wright brothers enforced their patent retarded the development of aviation by more than a decade. In fact, it was this that brought about the first expression of the activity which is the focus of the book under review: abrogation of the monopoly power granted by a patent.

When the United States entered World War 1 in 1917, it was clear to its government that the Wrights’ practice of strict enforcement of patent monopoly rights would make development and production of aircraft in the quantities needed impossible. Consequently, the government forced all the relevant firms to form the Manufacturers’ Aircraft Association (MAA), the first ‘patent pool.’ Each member had to assign all its patents to the Association, which classified and reported on them to all other members, who were then free to use them. Retrospective compulsory arbitration was then used to distribute rewards. MAA members later claimed that the world dominance of the US aircraft industry owed much to the resulting elimination of wasteful duplication in R&D, coupled with rapid diffusion of innovation into the products of member firms.

The MAA was only the first of many such patent pools to be formed by trade associations. However, the strengthening of anti-trust legislation saw these pools under attack from the US Department of Justice on the grounds that they eliminated competition in R&D, and even the MAA was dissolved.

The next step in firms’ readiness to allow some limitation on their patent rights related to standards. Common standards offered convenience to consumers and encouraged the expansion of markets. For the firm, the most usual motivation for voluntary limitation of patent rights was

the benefit arising from standards that reflected its own product specifications. This was worth dedicating patents to the public.

The relationship between patents and industry standards has generally been to the advantage of large firms:

The informal, market-driven process of standardisation, installed base effects, which force consumers to follow the choice of other consumers, may strengthen the market power of a dominant firm. In network markets where network externalities are significant, the importance of the predominant installed base position is likely to lead the standard's owner to predatory price-fixing strategies, which may be used to increase entry barriers. (Hun Park, 2010, p.22)

Patent pledges, the subject of this book, extended this relationship. Defined by the editors, such pledges are:

Commitments made voluntarily by patent holders to the public at large to limit the enforcement or other exploitation of their patents ... without any direct compensation or other consideration. (p.2)

It is a safe assumption that these commitments are not made from altruism, a matter raised by Clark Asay in his chapter:

If the economic benefits of a patent's exclusive rights are crucial to incentivizing innovators to invent, publicly disclose and commercialize socially beneficial inventions, as traditional patent law theories teach, then why are increasingly more patent owners voluntarily limiting such rights through patent pledges? (p.227)

Timothy Simcoe explains the apparent paradox:

... a profit-maximizing seller can benefit from a commitment to increased competition if the reduction in unit margins is more than offset by an increase in the quantity demanded. (p.285)

In other words, if all firms have valid patents and enforce them, markets will remain smaller than they would be were there low or no barriers to entry. A striking illustration of this is the transistor, invented by Shockley, Bardeen and Brattain in Bell Laboratories. Had Bell attempted to enforce its patent rights, there might have been political repercussions for the parent firm's monopoly of landline telephony. Consequently, Bell offered licences to all-comers for a flat fee of US\$100,000. Because the transistor invention came to be developed and used in so many different ways, Bell gained more – and more quickly – than it would have done from patent monopoly.

Giving up all or part of a monopoly, either to an industry standard or for the sake of stimulating more rapid growth of a new market, assumes that there is an alternative way of protecting the information the firm generates from its R&D. And there is: *capability* market power. This is the power to exclude others from a market, which results from investing in productive assets. If a firm invests enough, and well enough, it erects a barrier to entry that eliminates most competition. The only challengers left are the few that have invested on a comparable scale, since only they can benefit from similar economies of scale and scope.

The least that this kind of market power delivers is membership of a lucrative oligopoly, and at the limit it can confer a *de facto* monopoly. Nippon Steel, for example, has invested so much and so well that it is the only firm in the world able to produce a nuclear reactor container from a single huge block of highest grade steel. Since earlier failures have been traced to joints in such containers, and no other firm can yet offer containers free of these, it is no surprise that Nippon has a ten-year waiting list and can charge accordingly.

Firms with this kind of market power can afford to give patent pledges because their profits do not primarily depend on their patents. In fact, a strong barrier to entry from capability enables firms to innovate without any intellectual property at all, and this is how most of the world's incremental innovation (which would probably fail the patent system's non-obviousness criterion anyway) is protected. A major advantage that capability market power has over a patent is that no legal costs are incurred in defending it. And since everything depends on scale, if the market can be expanded by making a few pledges not to enforce patents fully, it is easy to see why making pledges can be in a firm's perceived interest. In exchange for a much larger market, the firm is giving away only part of its patent protection. Empirical research has shown this to be the least important means of capturing rewards from R&D in non-chemical technologies.

Of course, the strength of this basic motivation to make patent pledges varies among industries. The book deals exhaustively with this and exploits a database of 150 pledges assembled by Jorge Contreras, the editor. These were discussed at a workshop and a symposium, the papers from these becoming the chapters of this volume. These cover such topics as open source, trolls, blockchain and decentralized consensus technologies, cloud computing and the need for a formal register of pledges. Notably absent is patent pledging by chemical firms, and the reason is obvious. Pledges are an indication of the patent system's failure to deliver what it promises: we do not find pledges being given by firms in the industry for which patents actually work. Even the biotechnology industry is unsympathetic to pledges (p.56). Of some interest is the book's inclusion of the actual texts of pledges made by Tesla, IBM, Google, Myriad Genetics, Monsanto, Red Hat and Microsoft.

For those concerned with patent sharing in any form, this is not just a useful book, but probably an essential one. But nothing changes the reality that the patent pledges it discusses are no more than an attempt to make the best of an outdated means of protecting information. Unfortunately, the patent system is quite impervious to pressure for the radical changes it needs. This is primarily because of the strength of the example of United States practice, which in turn is hamstrung by that country being the only one in the world that defines a patent in its constitution. Just one illustration of the effect of this: US patent law could not be adapted to enable *corporate* research and development; this had to be dealt with through an *employment law* decision by the Supreme Court (*US v. Burns*, 1871). If patent reform is ever to come, therefore, it will have to start in a country other than the United States. Neither can an initiative be expected from the European or Japanese Patent Offices as their trilateral arrangements with the US Office commit them to existing arrangements.

The reforms that are needed are possible, and would make patent pledges redundant. They are even pointed to by Asay in this volume (see note 5, p.230). The solution is to protect non-chemical innovation *directly* in a way that dispenses with the monopoly element in protection, and gives originators the prospect of much better returns than patents. At the same time, any new technology could be instantly exploited along alternative paths to achieve its potential (see Kingston, 2010, Chapters 7 and 11). What a splendid thing it would be if the outstanding effort and brainpower demonstrated in this book could now be devoted to these and similar reforms of the patent system.

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