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*The law & economics of
intellectual property*

Legal disputes over intellectual property have exploded in recent years. No field of law is in greater ferment. And in no field of law have judges and scholars experienced more difficulty recently in getting their bearings.

The increase in intellectual property litigation was made inevitable by the rise of the information economy, an economy built on intellectual property – which is now, incidentally, America’s largest export. Recognition of the importance of intellectual property in the current American scene is one of the things that lie behind the seemingly relentless expansion of intellectual property rights in modern law.

Two illustrations of that expansion: the copyright term has been repeatedly enlarged in recent years, to the point where copyrights are as a practical mat-

ter nearly perpetual. And the new “business method” patents create the potential for inventors of new methods of doing business to obtain enormous monopoly power (imagine if the first person to think up the auction had been able to patent it); such patents also create a reward greatly in excess of the cost of the invention.

The emergence of new technologies has further caused the law to lose its bearings, and this in two respects. First, one of the most important of these new technologies, computer software, is characterized by high monopoly potential conjoined with an extreme disparity between the cost of creation and the cost of making and distributing copies, which indeed approaches zero whenever the copy is made electronically and is distributed over the Internet. Property rights in software may enable its creators to reap enormous profits by charging prices that inhibit distribution, while denying property rights may, in the interest of discouraging excessive investment in software creation and of maximizing distribution, kill the goose that lays the golden eggs by depriving the creators of software of the profit opportunities needed to finance that creation. That is the essential dilemma in crafting a sensible, efficient regime of intellectual property rights.

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Second, the products of the new technologies are sometimes hard to fit into the law's pigeonholes. Computer software is a kind of text, which implies that copyright is the proper regime; a kind of machine, which implies that patent is the proper regime; and a kind of algorithm, which traditionally has not been protected by either body of law. In biotechnology, the creation of new forms of life by genetic engineering poses acutely the question of just what should be regarded as patentable technology.

A further example of how new technologies can confound legal classifications is again drawn from computer software. Software manufacturers increasingly are bypassing the limitations (discussed below) on the duration and scope of copyrights by selling directly to their customers, pursuant to contracts that limit the customer's rights in the software more tightly than copyright would do. The significance of intellectual property rights, as of rights to physical property, is that they are enforceable against strangers. A trespass is enjoined even if the trespasser never promised not to enter your land. But if the only people who have access to your property happen to be people with whom you have a contract, you can regulate their access by means of contract and forget about property law.

The information economy and its associated novel technologies arose against the background of a mature system of intellectual property law, one that had evolved over centuries out of ancient concepts developed to deal with tangible property. To understand the law of intellectual property, and the muddle we're now in, you must first understand the law of physical property and the social objectives of that law.

When lawyers speak of a "property right," say to a parcel of land, they mean

simply that the holder of the right is entitled to invoke the aid of the state to prevent anyone from entering upon the land without his consent. There are all manner of qualifications of this right (eminent domain, for example – the landowner can't prevent the government from taking his land for a public use, although he can insist that the government pay him just compensation for the taking), but they can be ignored.

What cannot be ignored is why property rights are granted – what social functions they serve. Two are paramount. First, without exclusive rights to the use of tracts of land or other valuable physical objects, these properties would be overused – if anyone has the right to graze his cattle on a pasture, the pasture will be overgrazed and hence depleted prematurely, because each cattle owner will tend to ignore the costs that the grazing by his cattle imposes on the other users of the pasture. Second, without exclusive rights, there will be insufficient incentives to invest in improving property: if you cannot be assured of being able to reap where you have sown, you won't sow, and the land will lie fallow.

It is understood, however, that the social benefits of property rights must be balanced against the costs. When property has little value relative to the costs of creating or enforcing a property right, the right is withheld. Here is a homely example: owners of shopping centers do not charge a price for parking in the shopping center's parking lot. In effect, the owner declines to enforce his property right in the lot, treating it instead as the common property of the shopping center's customers, like a common pasture. This is because charging a fee for entry to the lot, while it would have an economizing effect (the lot could be smaller if access to it were rationed by

price, just as tolls limit highway traffic), would cost more than it would be worth; part of the cost would be discouraging people from shopping at the center.

We can follow these themes into the law of intellectual property, but with important qualifications. One is that, in contrast to the grazing example, the use of intellectual property by one person usually doesn't diminish its value to other users. That's because the copies of such property can be multiplied indefinitely at little added cost. If I read a book, I do not deprive others of the use of the intellectual property constituting that book, because they can buy and read other copies without interfering with me. Indeed, widespread use of intellectual property can actually increase the value of the property; in effect, additional copies have negative cost, when the value they confer is taken into account. A popular book or movie becomes a focus of discussion; the more popular it is, the more "copies" of it (in effect) there are, the greater the value.

There is an interesting exception, however, concerning what is called the "right of publicity," confusingly classified as part of the "right of privacy." A person has a right not to have his name or likeness used for advertising or other commercial purposes without his consent. This is a right particularly valued by celebrities. Should there be such a right? Does it have useful incentive effects, comparable to the effect of granting property rights to land to create the incentive to cultivate the land? And even if it does, what should happen when the celebrity dies? Should the right die with the celebrity, on the theory that he will no longer be "incentivized" by it to cultivate his image and that therefore anyone should be free to use his name and likeness in advertis-

ing? The answer is No, for the same reason that property rights are recognized even in "natural" pastures, that is, pastures not created or improved by investing, unlike ordinary farmland: there would be overuse. The advertising value of the celebrity would be reduced if the celebrity's name and likeness could be attached to an indefinite number of different products. There can be "congestion" even of intellectual property. And this is true whether or not the celebrity is still alive.

Still, in general, the use of intellectual property by one person does not reduce the value of its use by another. Stated differently, the marginal cost of intellectual property – the cost of adding one more user of it – is very low. As I noted earlier, it is essentially zero in the case of computer software, which can be delivered to a new user over the Internet – and it can even be negative.

This has led some students of intellectual property to think it would be desirable to make such property available for free to anyone who wanted to use it, since, in general, optimum output is achieved by equating price to marginal cost, and in the case of much intellectual property this means setting the price at (or only trivially above) zero – or even subsidizing distribution.

But as is now well understood, such a policy would be disastrous. It would kill the incentive to create the intellectual property in the first place, outside of the relatively rare cases in which the creators have powerful nonmonetary incentives to create such property, or in which its creation is financed other than by sale or lease of the property (by taxation, for example, or charitable donation – such as the patronage of authors by wealthy people, in the old days). We need not suppose that most creative people are greedy to realize that if they can-

not obtain a pecuniary benefit from producing intellectual property they will not be able to finance the costs (including the costs of their time) required to produce it.

And so the state defines, recognizes, and enforces property rights in intellectual property. The most important such rights are copyrights and patents, the former a property right in expression, the latter a property right in useful ideas. A third very common form of intellectual property, trademarks, is misnamed, and I will not discuss it extensively. Trademarks are merely identifiers, designed to protect consumers from being misled regarding the origin or quality of particular products or services. There are many interesting legal and economic issues concerning trademarks, but they are not centrally issues of property. Also of importance in the broad domain of intellectual property is the right of publicity, which I've already mentioned, and trade secrets, which are an alternative to patents as a method of protecting innovations from being copied without compensation to the inventor. But I will not discuss trade secrets.

Copyrights and patents are both limited in duration, unlike rights in physical property, and an initial question is why? There are several answers, and they point to the fundamental differences between physical and intellectual property.

One answer is the tracing problem, which looms large in the definition and enforcement of intellectual property generally. Items of physical property are visibly distinct; this is true even of adjacent parcels of land, once the boundary has been mapped and fenced. But one piece of intellectual property is not visibly distinct from others; it is identified only by comparison with others. Two copies of the same book are physically distinct, but the intellectual property

contained in them is identical. Worse, two different books may be sufficiently similar to raise a question of whether the intellectual property in one was appropriated by the author of the other. If copyright were perpetual, James Joyce or his publisher would have become embroiled in litigation with the heirs of Homer over whether *Ulysses* infringed the *Odyssey*, and Leonard Bernstein with the heirs of Ovid over whether *West Side Story* infringed *Pyramus and Thisbe* (not to mention *Romeo and Juliet* and *A Midsummer Night's Dream*, themselves arguably infringements of Ovid's story). If patents were perpetual, heirs of Leonardo da Vinci would be litigating over rights to basic aircraft technology.

The tracing problem is more serious for copyrights than for patents. The Patent and Trademark Office contains descriptions of patents classified by subject matter, and it is feasible though often difficult to search through these descriptions and identify the patents that a proposed new patent may infringe. But it is impossible as yet to search through the entire body of copyrighted materials. That is one reason why copyright protection is more limited than patent protection. A copyright is infringed only if it is copied; if it is duplicated innocently, there is no infringement. A patent is infringed by being duplicated, even if the duplication was innocent – a case of independent discovery.

Even in the case of copyright, however, the tracing problem is really rather superficial. If copyright owners were required to renew their copyrights periodically by filing a notice of renewal in a public registry, it would be simple enough for creators of new intellectual property to determine whether a given work was in the public domain.

There is a more serious concern with giving the owner of intellectual property

too expansive a right. If copyright were perpetual, Ovid's heirs would probably win their suit against Leonard Bernstein; Shakespeare's heirs certainly would (*West Side Story* is based directly on *Romeo and Juliet*) – except they might lose in turn to Ovid's heirs! This means that cutting off copyright protection after a specified period shorter than eternity not only limits tracing costs, but also reduces the pecuniary gain to the owner of the copyright.

There are two reasons why that might be a good thing. First, intellectual property presents a more serious problem of what economists call “rent seeking” than physical property does. A “rent,” in economics, is not a rental; it is an excess of revenue over cost. It is pure profit, which is to say profit in excess of the cost of capital (which is not “profit” in an economic sense but merely another cost of doing business). Rent seeking can be bad from a social standpoint because it can lead to excessive investment.

An example is a hunt for buried treasure. If the treasure has a value of \$10 million, which will be awarded to the first finder, there will be a race to be first that may eat up the entire profit. Suppose that the cost to a particular finder of finding the treasure by April 1, 2002, would be \$1 million. Would-be finders might incur much greater costs in vying to find it sooner – for example, a finder who was confident that by expending an additional \$8 million he could win the race by finding the treasure on March 31 would consider the expenditure worthwhile, since it would yield him a profit of \$1 million. But the additional cost incurred to win the race would be wasted from a social standpoint, because the social benefit of finding the treasure a day earlier would be negligible.

The problem of rent seeking is no longer acute in the case of the historical-

ly most important form of property, land, because virtually all land is owned. (The situation was quite otherwise in the age of exploration and discovery of new continents.) There would be no rent-seeking problem in the buried-treasure example if someone owned the treasure and were merely offering a reward to the finder – the owner would set the reward at a level designed to obtain the finding service at least cost.

But, as noted, the problem of rent seeking is acute in the “land grab” phase of development – and that is the phase we're perpetually in with regard to intellectual property. For remember that intellectual property is created rather than found, which means that if rights to intellectual property are defined too broadly, the rents generated by them will be so great that excessive resources will be drawn into efforts to be the first to create a valuable piece of intellectual property and thus to obtain the property right to it. Limiting the duration of the property right is one way of cutting down its value to the owner and thus reducing the amount of rent seeking.

But, once again, this concern must not be exaggerated. Because of discounting to present value (that is, the preference for money now over the same sum of money years or decades hence), the difference in value to the creator of intellectual property of, say, a seventy-five-year term and a thousand-year term would actually be very slight, because the present value of a dollar not to be received for seventy-five years (or one hundred or one thousand years) is very slight.

A second reason for wanting to limit the potential reward to owners of intellectual property rights is the previously noted effect of those rights in limiting the distribution and hence use of intellectual property. The fees that the owner of intellectual property charges for its

use deflect some users to other products that may cost society more to produce (remember that the marginal cost, the cost of adding one more user, of intellectual property is often close to, at, or even below zero), resulting in a loss of efficiency. Some of those users, moreover, may be other creators of intellectual property, so that expansive intellectual property rights may actually reduce the creation of intellectual property – an important and counterintuitive point to which I'll return.

Against all this must be weighed the incentive effects of allowing the property owner to obtain revenue from property that may have cost him a great deal to create. But it doesn't follow that he has to be able to collect fees *in perpetuity* in order to recoup his investment. Perpetual fees may result in a reward that exceeds the cost of creating the property in the first place, thus resulting in a needless restriction of the use of the property along with the wasteful expenditures caused by rent seeking.

It is true, as I have said, that because most people discount future income steeply, the excess reward that perpetual fees would confer on creators of intellectual property is somewhat illusory. Few people will work harder today to generate some additional income to their heirs (if any) a century hence. But this means that perpetual fees have very little upside in creating incentives for the creation of intellectual property; the tracing costs, and the effect of perpetual copyright in complicating the use of existing intellectual property as an input into new intellectual property, become decisive objections to perpetual rights.

Disregarded in this analysis, however, is the point made earlier in connection with the right of publicity – the potential congestion cost if valuable property is unowned. For example, if anyone can

use the character of Mickey Mouse, the public may become tired of him, and his value may drop to zero. Suppose, moreover, that to create a demand for an old expressive work requires a current investment. What publisher would incur the expense and risk of developing a demand for an eighteenth-century author whose works were long out of copyright if the publisher acquired no property right in the works, so that if his expenditures succeeded in creating a demand for them, any other publisher could publish the works without incurring the expense that he had incurred? In both the Mickey Mouse case and in this case, there is overuse because of lack of property rights, but in the first case it leads to the value of the intellectual property plummeting, and in the second case it impairs the incentive to invest in intellectual property.

The solution might be a system of indefinitely renewable copyrights. The initial grant might be for twenty-five years, renewable thereafter every five years. A stiff fee would assure that most works returned to the public domain. But those works requiring continuing investment or careful management to avoid consumer exhaustion would continue to be owned property.

Copyrights and patents are limited in other ways besides duration. The copyright owner is permitted to copyright only the expressive dimension of the work and not the basic ideas or motifs. Even if copyright were perpetual, Homer's heirs could not demand a royalty for every epic poem written, since the idea of the epic poem (or of rhyme or particular rhyme schemes, or of a story of a war to recover an abducted beauty) would be considered to fall on the idea side of the idea/expression divide. Similarly, patents are limited to ideas that are useful (in the sense of practical, utilitari-

an), novel, and nonobvious, and so are not available for the fruits of basic research, such as Euclidean geometry, Planck's constant, or $e = mc^2$.

If basic scientific findings were patentable, the tracing problem would be particularly acute. Even more important, patents on basic research would sometimes generate grossly excessive revenues, relative to costs, which in the case of much basic research are low.

Similarly, if valuable applications of scientific theory (as distinct from basic research) – “inventions” or new technology – could be patented in perpetuity, one untoward result would be to limit the use of inventions, and another might be to draw excessive investment into innovation. Bear in mind that the patent process, like my hypothetical hunt for buried treasure, is a race. Whoever crosses the finish line first, if only by a day, receives the entire value of the patent, not the value of accelerating the invention by one day. So we want to make sure that the rewards of owning a patent are not so huge that they operate to suck a disproportionate fraction of society's scarce resources into efforts to accelerate the pace of invention.

As for allowing basic ideas, themes, motifs, character types, and so forth to be copyrighted, the effect in increasing the incentives to create new literature, art, and entertainment by increasing the financial rewards would be more than offset by the effect in discouraging that creation by forcing every new writer to negotiate permission with the heirs of long-deceased predecessors. Literature, art, and entertainment to a great extent play variations on a rather simple, stock set of themes, plots, character types, and so forth. The distinction, the quality, of creative expression lies precisely in the variations, and we want to encourage these by permitting the creators to draw freely on the stock.

A complication is created by the merger of “idea” and “expression” in some forms of modern art, such as Andy Warhol's *Brillo Box*, a work of art that is such not by virtue of any novel or distinctive expression – it is indistinguishable from an ordinary box of Brillo – but solely by virtue of its being treated as art by collectors and museums. In effect, this kind of art is simply the idea of treating an everyday object as a work of art.

I have thus far depicted the basic challenge in the fine-tuning of intellectual property rights as striking the right balance between the interest in encouraging the production of intellectual property and the interest in promoting its widespread use, though I have noted some other concerns as well (such as overinvestment and tracing costs).

But one of the most interesting characteristics of intellectual property, which differentiates it sharply from physical property, is that – paradoxically – limiting intellectual property rights may often be necessary to maximize the creation of intellectual property – in which event the conflict between the creation interest and the use interest disappears. I have given examples of this important point already. Consider now the “fair use” doctrine of copyright law, which permits in specified circumstances some copying of a copyrighted work without having to obtain the owner's consent. An example is quoting from and summarizing a copyrighted book in a review of the book. Suppose such copying required the consent of the book's author or publisher. Then book reviews would lack credibility, since readers would know that the reviewer had a strong incentive to review the book favorably lest publishers refuse to consent to his quoting from subsequent books, or charge him an exorbitant fee for permission to quote. Publishers and authors as a group (though maybe not the publishers and

authors of the worst books) would be hurt by a system that deprived readers of the information contained in reviews by people not beholden to the publisher. The publishing industry would lose the most credible form of advertising of its wares.

Similarly, but more fundamentally, anyone familiar with the practices of both authors and inventors knows that most intellectual property, even of a distinctly innovative sort, builds heavily on previous intellectual property (*Ulysses* is again an example). The existing stock of ideas and expression is, to a great extent, the raw material from which new intellectual property is fashioned.

The cheaper a producer's raw materials, the cheaper the final product and so the greater the output. If Joyce had had to negotiate with Homer's heirs over the use of material from the *Odyssey* in his book, it would have taken him longer to write the book; if negotiations had broken down, he might not have been able to write it at all.

We want, therefore, a process by which intellectual property, having been legally protected in order to create the proper incentives, can eventually be returned to the public domain, there to be available as cheap raw material for future creators of intellectual property. This is another important reason for limiting both the duration of intellectual property rights and their scope.

The economic analysis sketched in this paper is simple, largely intuitive, commonsensical, and, I venture to suggest, fairly uncontroversial. To summarize it, granting property rights in intellectual property increases the incentive to create such property, but the downside is that those rights can interfere with the

creation of subsequent intellectual property (because of the tracing problem and because the principal input into most intellectual property is previously created intellectual property). Property rights can limit the distribution of intellectual property and can draw excessive resources into the creation of intellectual property, and away from other socially valuable activities, by the phenomenon of rent seeking.

Striking the right balance, which is to say determining the optimal scope of intellectual property rights, requires a comparison of these benefits and costs – and really, it seems to me, nothing more. The problems are not conceptual; the concepts are straightforward. The problems are entirely empirical. They are problems of measurement.

In addition, we do not know how much intellectual property is in fact socially useful, and therefore we do not know how extensive a set of intellectual property rights we should create. For all we know, too many resources are being sucked into the creation of new biotechnology, computer software, films, pharmaceuticals, and business methods because the rights to these different forms of intellectual property have been too broadly defined.

Unfortunately, the empirical problems are acute – and little progress has been made as yet toward their solution. We urgently need more empirical evidence. The task is daunting, for it requires that we be able to estimate both the social gains from additional intellectual property of different types and the social costs of trying to induce the creation of the additional intellectual property by means of adjustments in the regime of intellectual property rights.