

PATENTS AND COPYRIGHTS:
DO THE BENEFITS EXCEED THE COSTS?

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“... it seems to me highly desirable that liberals shall strongly disagree on these topics, the more the better. What is needed more than anything else is that these questions of a policy for a competitive order should once again become live issues which are being discussed publicly; and we shall have made an important contribution if we succeed in directing interest to them” — F. A. Hayek (1948)

“The greatest constraint on your future liberties may come not from government but from corporate legal departments laboring to protect by force what can no longer be protected by practical efficiency or general social consent” — John Perry Barlow (1994)

1. Introduction.

Patents and copyrights are special forms of immaterial “property” that grant to their owners the exclusive right to control the production and sale of a specified product—a literary or artistic work in the case of copyrights, an invention or productive process in the case of patents. Often these concepts are subsumed under a broader concept of “intellectual property,” but they are not completely analogous and cannot always be justified with the same arguments. The term “intellectual property” also covers some other very different concepts, such as trademarks. Unfortunately, in recent discussions of these topics the concept of “intellectual property” is often used generically, blurring some very important practical distinctions.¹ This paper examines patents and copyrights in some detail, in order

¹A commercial (or “registered”) trademark is a sign or label that distinguishes a given manufacturer’s products from those of others. The trademark, once registered in a public registry, grants to its owner exclusive rights over its use. This guarantees the source of the product endorsed by the trademark, allowing consumers to buy with greater certainty (since the owners of well-known trademarks will have incentives to protect their value by maintaining quality standards for their products), and protecting manufacturers against forgeries (i.e., competitors trying to sell their own products by taking advantage of the good reputation of well-known trademarks). A trademark identifies the source of a product, but does not prohibit the manufacture of similar (or even identical) products, and therefore does not have the monopolistic character of the patent: If I decide to manufacture and sell “Chivas Regal” whisky I would be breaking the law, but that does not mean I cannot manufacture and sell whisky, as long as I do not use someone else’s trademark. The

to investigate their economic effects and determine to what extent they are compatible with the principles of a free society.

2. Patents as Property.

Although the term “intellectual property” is commonly used in the legal field, in economics it is rather problematic, since it is difficult to justify this type of property right with the same arguments that are used to justify private property in tangible goods.

According to the economic theory of property (following David Hume), society benefits from the delimitation and protection of private property rights because goods are scarce. There is no point in defining property rights over goods when these exist in abundance. On the other hand, when goods are scarce and property is communal, they are not used efficiently. Private property guarantees that scarce goods will be put to their most efficient and productive uses. It is difficult to justify intellectual property rights under this concept of property, since these rights do not arise from the scarcity of the appropriated objects—rather, their purpose is to *create* a scarcity, thereby generating a monopoly rent for the holders of these rights: here the law does not protect property over a scarce good, since the “scarcity” is created by the law itself (and this “artificial” scarcity is the source of the monopoly rents that confer value upon those rights). The big difference between patents and copyrights, and titles of property over tangible goods, is that the latter will be scarce even if there are no well-defined property rights, whereas in the case of patents and copyrights the scarcity only arises after the property right is defined.²

Defenders of patents often try to deny that they constitute monopoly privileges, arguing that the term “monopoly” is inapplicable in this case.³ This is partly a semantic issue, although in any event there is no contradiction or incompatibility between the notions of

existence of a patent, on the other hand, prevents me from producing and selling the patented product. For this reason, many people who accept the protection of trademarks as perfectly legitimate and of vital importance in a modern capitalist economy, nonetheless oppose patents on the grounds that they constitute monopoly privileges.

²In this century, perhaps the clearest statement of this argument is due to the English economist Arnold Plant, in a 1934 paper entitled “The Economic Theory Concerning Patents for Inventions” (Plant, 1974, pp. 35-56). On Plant’s economic thought see Coase (1986).

³For instance, Novak (1997), pp. 69, 144.

“patent as property” and “patent as monopoly,” and in practice they are closely related since the monopolistic nature of patents is precisely what confers economic value upon them.⁴ Obviously, like any other monopoly privilege, patents can be very valuable for their owners, though that is not in itself a good reason to justify concessions of that sort. Here the relevant questions are: What implications do patents have for efficiency in the allocation of resources, and why would society want to award privileges of this sort to some of its members? How does society benefit from the existence of patents? Why should society grant any special protection over the production and sale of certain products beyond that which is implied in the protection of trademarks?

Though the literature on patents often stresses inventors’ rights, a perusal of the relevant legislation clearly shows that it also embodies a strong presumption that awarding patents

⁴“A patent serves a fourfold purpose. Viewed morally and socially, and perhaps psychologically, it is a reward for unusual inventive ability. From the standpoint of economics and commercial law, it is a property right. Neither of these purposes—the reward to the inventor or the creation of a property right—have any restrictive economic effect in and of themselves. But then we come to the patent’s third phase—from the vantage point of the state, a patent is a grant of a monopoly to the inventor based on the public interest in promoting the growth and diffusion of technology. *It is the monopoly grant that makes tangible the inventor’s reward and converts a formal into a realistic property right.* Moreover, the monopoly grant has a *prima facie* impact on trade, because the monopoly conferred by the patent is the right to exclude others from manufacturing or selling the patented product, or from practicing the patented process” (Timberg, 1962, p. 72, italics added)—cf., the following comments by F. A. Hayek: “The problem of the prevention of monopoly and the preservation of competition is raised much more acutely in certain other fields to which the concept of property has been extended only in recent times. I am thinking here of the extension of the concept of property to such rights and privileges as patents for inventions, copyright, trade-marks, and the like. It seems to me beyond doubt that in these fields a slavish application of the concept of property as it has been developed for material things has done a great deal to foster the growth of monopoly and that here drastic reforms may be required if competition is to be made to work. In the field of industrial patents in particular we shall have to seriously examine whether the award of a monopoly privilege is really the most appropriate and effective form of reward for the kind of risk-bearing which investment in scientific research involves. Patents, in particular, are specially interesting from our point of view because they provide so clear an illustration of how it is necessary in all instances not to apply a ready-made formula but to go back to the rationale of the market system and to decide for each class what the precise rights are to be which the government ought to protect. This is a task at least as much for economists as for lawyers. Perhaps it is not a waste of your time if I illustrate what I have in mind by quoting a rather well-known decision in which an American judge argued that ‘as to the suggestion that competitors were excluded from the use of the patent we answer that such exclusion may be said to have been the very essence of the right conferred by the patent’ and adds ‘as it is the privilege of any owner of property to use it or not to use it without any question of motive’ [*Continental Bag Co. v. Eastern Bag Co.*, 210 U.S. 405 (1909)]. It is this last statement which seems to me significant for the way in which a mechanical extension of the property concept by lawyers has done so much to create undesirable and harmful privilege”—Hayek (1948), pp. 113-14 (see also Hayek, 1988, pp. 36-37).

for invention favors the public interest as well. The first formal patent law was that of the United States, passed in 1790 and based on a provision of the new Constitution of 1787, which in its enumeration of the powers vested in Congress, included the power “to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries” (Art. I, Sec. 8, paragraph 8). In view of this, it is certainly interesting that from the very beginning there was never any real consensus over the benefits of adopting a patent system. Some of the most prominent drafters of the U. S. Constitution (among them several outstanding inventors) were opposed to the idea, sometimes vehemently. Among them, we can mention Benjamin Franklin, who refused the offer of a patent in his favor for the invention of his famous stove: “ ... as we enjoy great advantages from the inventions of others, we should be glad of an opportunity to serve others by any invention of ours; and this we should do freely and generously.”⁵

Although patents of invention originated in Europe, there was no consensus there in the recent past either. In fact, during the 19th century there was a very intense debate on the subject, especially in the quarter century between 1850 and 1875, and at one point the victory of the anti-patent movement seemed quite likely. The eventual triumph of the pro-patent position in the legislative arena reflects a political victory, but not necessarily an intellectual victory.⁶

3. Patents and Technical Progress.

Modern defenders of the patent system, dazzled by the wonders of modern technology, never cease to stress the need to stimulate further technological development. Often cited in this context are the famous pioneer studies by Robert Solow and Edward Denison on the importance of technical progress for the explanation of economic growth.⁷ The manner in which these studies are cited, however, is intriguing. These citations are made in a very general manner, and one gets the impression that authors that resort to this tactic want to

⁵*The Autobiography of Benjamin Franklin* (Franklin, 1909), p. 112. Thomas Jefferson was also opposed to patents—for a discussion of Jefferson’s views see Meier (1990).

⁶For a history of this now-forgotten debate and a very detailed survey of the voluminous English, German and French literature that it generated, see Machlup and Penrose (1950).

attribute the *entirety* of said technical progress to patented inventions. The fact, however, is that the notion of “technical progress” in Solow-Denison type studies is a very broad category that covers, in principle, any increase in production that cannot be attributed directly to increases in the use of inputs or basic factors of production—i.e., it is equivalent to what we describe nowadays as “total factor productivity.” This includes not only the effect of new technologies (not all of which represents patented inventions), but also the effects of economies of scale, and of improvements in the quality of the labor force, including better education (Denison tries to isolate the effect of education), health and nutritional levels of the labor force, and even changes in its demographic make-up. Thus, it would be short-sighted to attribute “technical progress” entirely to technological innovation *per se*. But even discounting the very important role of education and other improvements in the quality of the labor force, to attribute the residual effect entirely to a *certain type* of technological innovation (patented inventions) would be like attributing the effect of “education” entirely to formal instruction as imparted in schools (an error that is also quite common). The fact of the matter, however—and contrary to what is assumed in the pro-patents literature—is that patented inventions account for only a fraction of relevant productivity growth. Zvi Griliches, a leading expert on the study of productivity, is quite explicit on this point:

... not all of productivity growth is due to invention and only some fraction of the latter arises from patented inventions. If one takes 1.5 to 2.0 percent as the approximate growth rate per year in total factor productivity, at least half of it is likely to be due to the growth in the quality of the labor force, economies of scale, and various allocations of capital between assets and industries. Moreover, it is unlikely that patented inventions could account for more than half of the relevant advances in knowledge. This leaves us with at most a quarter of total productivity growth, and an unknown fraction of its fluctuations, to be attributed to patented invention (Griliches, 1990, p. 1699).

Even this probably over-states the net effect of patents, since in principle we would like to estimate the *marginal* benefits derived from the existence of patents, i.e., the inventions that would not have been produced without them. Since patent protection increases the average return on inventive activity devoted to patentable inventions, thereby inducing more activity of this kind, it seems safe to conclude that the elimination of patent protection would probably adversely affect production of this type of inventions. But what would be

⁷For instance, Sherwood (1990), pp. 82-83. The studies cited are Solow (1957) and Denison (1979).

the magnitude of that loss? We cannot just assume that *all* patented inventions are due to the existence of patents, since many of them would have been developed even without that incentive.⁸ On the other hand, it certainly seems reasonable to assume that patents must have *some* effect on technological innovation, which is confirmed by the theoretical models, but again the interesting question is the practical magnitude of this effect.⁹ In this regard, the predictions of the formal models stand in striking contrast to the available empirical evidence: although the effect is theoretically important, the results of the few studies that have tried to detect it empirically do not favor the pro-patents position. Edwin

⁸There is not much agreement among economic historians regarding the importance of patents as a factor in the Industrial Revolution. Ashton (1948) thought that patents were unimportant (“It is at least possible that without the apparatus of the patent system discovery might have developed quite as rapidly as it did,” p. 11), and Mokyr (1990) expresses a similar view (“A patent system may have been a stimulus to invention, but it was clearly not a necessary factor,” p. 177). On the other hand, Douglass North argues that patents had a significant impact: “The failure to develop systematic property rights in innovation up until fairly modern times was a major source of the slow pace of technological change a systematic set of incentives to encourage technological change and raise the private rate of return on innovation ... was established only with the patent system In the absence of property rights over innovation, the pace of technological change was most fundamentally influenced by the size of markets. Other things equal, the private return upon innovation rose with larger markets. An increase in the rate of technological change in the past was associated with eras of economic expansion. In summary, economic historians of the Industrial Revolution have concentrated upon technological change as the main dynamic factor of the period. Generally, however, they have failed to ask what caused the rate of technological change to increase during this period: often, it would appear that in arguing the causes of technological progress they assume that technological progress was costless or was spontaneously generated. But in sum, an increase in the rate of technological progress will result from either an increase in the size of the market or an increase in the inventor’s ability to capture a larger share of the benefits created by his invention” (North, 1981, pp. 164-66). North is quick to point out, however, that “It would of course be misleading to put too much stress on a single law More important than patent law per se is the development and enforcement of a body of impersonal law protecting and enforcing contracts in which property rights are specified” (p. 165). Again, it is important to stress that technological change is not the only source of productivity growth (and sometimes not even the major source). Interestingly enough, North goes on to cite his own study of productivity change in ocean shipping (North, 1968), which found that the major sources of the rise in total factor productivity over the 2½ centuries from 1600 to 1850 were not primarily technological developments, but rather the decline of piracy (allowing ships to reduce manpower and armament, and also lowering insurance costs), more voyages per ship per year (due, not so much to increased speed, but to less average port time per ship), and an increased load factor on return trips. The interesting thing to note in this context is that none of these important sources of productivity change were primarily technological in nature. In North’s own words: “... declining transaction costs—a result of reduced piracy, increases in size of ships, growing trade, and reduced turnaround time—led to substantial productivity growth beginning (at least) 150 years before the Industrial Revolution; and they, *more than technological change*, were responsible for productivity increases” (North, 1981, p. 166, italics added).

⁹Most modern formal models follow the “Nordhaus-Scherer model”—see Scherer (1972).

Mansfield directed two important studies on this topic in the 1980's (Mansfield, Schwartz and Wagner, 1981; Mansfield, 1986). The first one studied 31 patented innovations in four industries (chemicals, pharmaceuticals, electronics, and machinery). One of the purposes of the study was to answer a very simple question: What proportion of innovations would be delayed or not introduced at all if they could not be patented?

To shed light on this question, we asked each innovating firm whether it would have introduced each of its patented innovations in our sample if patent protection had not been available According to the firms, about one-half of the patented innovations in our sample would not have been introduced without patent protection. The bulk of these innovations occurred in the drug industry. *Excluding drug innovations, the lack of patent protection would have affected less than one-fourth of the patented innovations in our sample* (1981, p. 915, italics added).

The results of the second study were even more negative:

According to detailed data obtained from a random sample of 100 firms from 12 manufacturing industries, patent protection was judged to be essential for the development or introduction of one-third or more of the inventions during 1981-83 in only 2 industries—pharmaceuticals and chemicals. On the other hand, in 7 industries (electrical equipment, office equipment, motor vehicles, instruments, primary metals, rubber, and textiles), patent protection was estimated to be essential for the development and introduction of less than 10 percent of their inventions. Indeed, in office equipment, motor vehicles, rubber, and textiles, the firms were unanimous in reporting that patent protection was not essential for the development or introduction of *any* of their inventions during this period.¹⁰

A more recent paper by Sakakibara and Branstetter (1999), which approaches the problem from a slightly different angle, also fails to support the pro-patents position. If patents do indeed stimulate innovation, then presumably stronger patent protection should induce a higher rate of innovation. The authors addressed the question “Do Stronger Patents Induce More Innovation?” by studying the impact of a significant Japanese patent law reform implemented in 1988. The main finding was that “the average response in terms of additional R&D effort and innovative output was quite modest.” An econometric analysis using Japanese and U. S. patent data on 307 Japanese firms confirmed that the magnitude of the response was quite small.

¹⁰Mansfield (1986), p. 193. On the other hand, as Mansfield points out, “this does not mean that firms patent only a small percentage of their patentable inventions. On the contrary, they seem to patent about 50 to 80 percent of them, which is testimony to their belief that the prospective benefits from patent protection ... frequently exceed its costs.”

4. Costs of the Patent System.

The benefits of patents, therefore, are not as large as one might assume at first glance. On the other hand, if these benefits were costless—if patents involved a sort of “free lunch”—then there would be no reason for complaint. The fact, however, is that there are several important costs that tend to be overlooked. Apart from the considerable administrative cost and the legal expenses associated with patent litigation,¹¹ perhaps the most obvious economic cost of a patent system is that, in order to create incentives for the production of inventions that otherwise would not have been developed, patents create monopoly privileges over inventions that would have been developed even without the incentive. However, there are also other important costs to consider:

- (1) In practice, the patent system often hinders technical progress. In the automobile industry, for instance, Henry Ford did not own the patent over the automobile, and had to fight against the owners of the patent, who constituted a closed cartel and were not interested in mass production of inexpensive models.¹² Another interesting case is the early history of aviation.¹³ Inordinately broad patents are especially problematic.¹⁴ A

¹¹“Legal fees during the 14-year long [Kodak-Polaroid] court battle cost Kodak ... \$100 million” (Rivette and Kline, 2000, p. 65).

¹²“At the time the Ford Motor Company was organized, the automobile industry was dominated by the Association of Licensed Automobile Manufacturers (ALAM), a select group of makers of gasoline automobiles who were attempting to monopolize automobile manufacturing in the United States through control of a patent on the gasoline automobile that had been awarded in 1895 to George B. Selden, a New York patent attorney. The ALAM companies ... were in the main committed to high unit profits through producing high-priced cars for a limited market. The ALAM tried to set production quotas and to freeze new entrances into automobile manufacturing. Henry Ford was denied a license ... under the Selden patent on the ground that he had not demonstrated his competence, and when Ford persisted in producing cars, the ALAM immediately brought a lawsuit against him for infringement of the Selden patent. The suit was ultimately decided in Ford’s favor in 1911 and the ALAM disintegrated” (Flink, 1990, pp. 181-82).

¹³“Orville and Wilbur Wright ... mimicked the wing twisting of gliding birds by constructing a mechanism that warped the horizontal plane of an airplane’s wings at either side in opposite directions. They patented this mechanism and claimed in their patent that their rights extended to any system that varied the ‘lateral margins’ in opposite directions.” Another group of aviation pioneers, financed by Alexander Graham Bell, “knew about the Wright patent but apparently had reservations about the wing-warping method Bell suggested wing flaps, or ‘ailerons,’ which had been used in France. [Glenn] Curtiss subsequently incorporated this concept in his successful flights of 1908 The Wrights sued Curtiss for patent infringement in 1909, claiming that their method applied to wing flaps as well as wing twisting. After protracted litigation, Orville Wright, ... , won

recent example has occurred in the field of “bio-technology”: In October 1992, the U.S. Patent and Trademarks Office awarded to a single company, Agracetus Inc., of Middleton, Wisconsin, a patent for rights to *all forms* of genetically engineered cotton—no matter what techniques or genes are used to create them—prompting the following comment from an executive in this industry: “It was as if the inventor of the assembly line had won property rights to all mass-produced goods, from automobiles to washing machines” (Stone, 1995, p. 656).

- (2) The existence of patents also induces wasteful expenditure of resources by competitors in order to “invent around the patent,” i.e., develop competing products that are sufficiently differentiated so as not to infringe an existing patent. Nelson (1981) puts it this way: “There are incentives for a firm to duplicate the prevailing best technology patented by another firm in a way that does not infringe on patents. More generally, there are incentives for a firm to develop a technology even if it is worse than the current best one, if it is better than the one it has and the best is blocked by patents” (p. 107). As Nelson points out, though these activities increase the level of “research and development” spending, from the social point of view they are not necessarily an efficient use of available resources.¹⁵

the case in 1914 Curtiss [then made] a small change in his method of controlling the ailerons, which required the Wright corporation to begin litigating anew. Orville Wright sold out at this point, but the successor company continued to press its claims. With the formal entry of the United States into World War I imminent, however, a solution to the patent litigation was sought by the government since some firms were reluctant to take contracts because of the threat of patent infringement suits. The Wright-Martin Company ... was threatening to sue those considered to be infringers—effectively any airplane manufacturer” (Bittlingmayer, 1988, pp. 230-32). As the author of this study points out in a footnote: “It seems unlikely that broad definitions—a patent on the automobile or on the airplane—could be defended on economic grounds. Although the Wright brothers threw their energies into airplane invention in the hope of becoming wealthy ... others, imagining much smaller rewards looming ahead of them, were right behind. The development of a successful flying machine was only a matter of time, and it is unlikely that the introduction of the airplane a few years sooner would have been worth a monopoly grant on the airplane ...” (p. 246n).

¹⁴“ ... for nearly a quarter of a century, for example, James Watt was able to prevent other engineers from constructing new types of steam engine, even under license from himself” — Ashton (1948), p. 10. At least one historian argues that the Industrial Revolution did not really take off until 1785, the year Watt’s patent expired (Rougier, 1971, p. 118).

¹⁵Worse still, patent-owners also have incentives to do the same thing (i.e., “invent around” their own patents) in order to preclude potential competition. To the extent that these activities are induced by the patent system itself, resources devoted to them (as well as the associated legal

- (3) Technological innovation is often stimulated precisely when patents are not very effective. This was the case of the Eastman Kodak company, that decided to adopt its well-known policy of permanent research and “continuous innovation” as a way to maintain its competitive leadership in view of the practical impossibility of enforcing all its patents (Jenkins, 1990, pp. 134-36). Presumably, had they been able to enforce their patents they might well have devoted fewer resources for research and development of new products, and technological development in this industry would have been less rapid.
- (4) An aspect of the problem that does not always receive enough consideration is that the existence of patents might distort incentives, diverting inventive activity towards more easily “patentable” products. Again, we should bear in mind that not all discoveries and innovations are patentable, even when they are highly beneficial. Milton Friedman made a very interesting comment in this regard in his book, *Capitalism and Freedom* (1962). After declaring himself in favor of patents, he added: “At the same time, there are costs involved. For one thing, there are many ‘inventions’ that are not patentable. The ‘inventor’ of the supermarket, for example, conferred great benefits on his fellowmen for which he could not charge them. Insofar as the same kind of ability is required for the one kind of invention as for the other, the existence of patents tends to divert activity to patentable inventions.”¹⁶ The 64 dollar question: Would we really have fewer inventions in the absence of patent laws, or would we simply have different *kinds* of inventions?

expenses) are essentially wasted from the social point of view, and should be regarded as another cost of the system. To cite an example, Bresnahan (1985) mentions that, to protect its monopoly position in the market for plain-paper copiers, Xerox patented every conceivable aspect of its technology. “IBM had spent millions to ‘invent around’ Xerox’s major patents—with 25 percent of the budget going for patent counsel, not R&D” (p. 16). For another interesting example of “preemptive patenting” see the article by Reich (1977) on the early history of radio broadcasting.

¹⁶Friedman (1962), p. 127. A case in point: “The biotech firm Genetics Institute decides which version of a drug to develop partly based on which iteration shows the best results in clinical trials but also according to which version can command the strongest patent protection. Genetics Institute patent counsel says the strength of the potential patent position is ‘a leading factor’ in deciding what research to pursue” (Rivette and Kline, 2000, p. 58).

5. The Case of Copyrights.¹⁷

Though they have had different legislative histories, patents and copyrights share many common features, and much of what has been said about patents applies equally well to copyrights. Just as the pro-patents literature stresses inventors' rights, the pro-copyrights literature stresses the rights of authors and other creators to benefit from their creations, though it should be noted that the term "copyright," as currently used, actually comprises a bundle of several different rights that are unfortunately (and misleadingly) conflated due to the use of a single concept to cover the whole bundle.

The expression used in other languages to denote "copyright" (*derecho de autor*, *droit d'auteur*, *diritto d'autore*, *direito do autor*) literally translates as "authors' rights," which includes the notion of copyright in the narrower sense (the right to control reproduction of the work), though it also implies that a broader range of different rights are also intended. These include the so-called "moral rights" of the author, which view literary and artistic works as extensions of the author's personality, and encompass the following protections: (1) the right to be identified as the creator of the work (so-called "paternity rights" of authorship and protections against plagiarism), and (2) protections against unauthorized alterations or mutilations of the work (so-called "integrity rights" of authorship). As opposed to mere copyright, these two moral rights of authorship have always been regarded as inalienable and perpetual. (A third moral right is also recognized: the right to withhold publication, which is an aspect of a broader right to privacy, although it is not always clear whether it should be regarded as perpetual or whether it applies only to living authors, i.e., if society should be bound by an author's wishes after his death.)

Opposition to copyright in the narrower sense obviously does not imply opposition to the moral rights of authorship, which are very old legal concepts and have never been questioned. Copyright, on the other hand, is a fairly recent notion, which dates from about the time of the invention of printing. Whether or not we regard the right to control the reproduction of creative works as a "natural right" of authors, the historical fact is that prior to the invention of printing this right was not regarded as implicit in the concept of authorship. Copyright law was created by specific acts of legislation, and every extension of its scope to cover new productions resulting from technological innovations (such as

¹⁷The views expressed in this section are largely based on Plant (1934b) and Hurt (1966).

photography, phonographic recordings of musical creations, film productions, computer software) has required special legislation to that effect, since these extensions did not arise “naturally” from judicial decisions, as the courts were unwilling to apply to these situations a concept created specifically for the case of printed books:

The concept of copyright is rooted in the technology of print. The recognition of a copyright and the practice of paying royalties emerged with the printing press Copyright was a specific adaptation to a specific technology, and to the problems and opportunities it created. The law recognized that. The landmark case in the United States was *White Smith v. Apollo* [1908]. It denied protection to piano rolls or sound recordings because they were not “writings” in tangible form readable by a human being. That common law concept of copyright excluded from protection many new technologies of communication since 1908. But the motion picture industry, the recording industry, and more recently the broadcasting industry have persuaded Congress to extend various protections to them, since courts were not willing to do so However, with the arrival of radio and electronic reproduction, and now photocopy reproduction, the concept becomes inappropriate. There is no easy way to keep tabs on the numerous reproductions in somewhat variable form that can take place in innumerable locations with these new technologies. The analogy is to word-of-mouth communications in the 18th century, not to the print shop of that period. Nonetheless, information and publishing industries whose welfare and survival depends on finding some way to charge for their information processing services have latched on to copyright protection under statute law, and are trying to get the courts or the Congress to extend copyright protection to computerized data, photocopies, and telereproduction. Though recognizing that in those technologies the existent copyright law is basically unenforceable, they nonetheless grab on to whatever frail reed it may provide rather than turn to the even frailer reed of trying to invent, and to get into legislation, some entirely new as yet undevised system for rewarding the creators of information the U. S. Congress passed a new copyright law in 1976, which was designed to solve all the new problems of copyright for cable television, photocopying, and computers. It has solved few if any of them How inappropriate the concept of copyright is to computer communications becomes evident as we examine how the law has to squirm to deal with the simplest problems the process of computer communication entails processing of texts that are partly controlled by people and partly automatic. They are happening all over the system. Some of the text is never visible but is only stored electronically: some is flashed briefly on a terminal display; some is printed out in hard copy The receivers may be individuals and clearly identified, or they may be passers-by with access but whose access is never recorded; the passer-by may only look, as a reader browsing through a book, or he may make an automatic copy; sometimes the program will record that, sometimes it will not. To try to apply the concept of copyright to all these stages and actors would require a most elaborate set of regulations. It has none of the simplicity of checking what copies rolled off a printing press One would like to compensate an author if a computer terminal is used as a printing press to run off numerous copies of a valuable text. One would not like to impose any control as someone works at a terminal in the role of a reader and checks back and forth through various files. The boundary, however, is impossible to draw. In the new technology of interactive computing the reader, the writer, the bookseller, and the printer have become one. In the old technology of printing one could have a right to free press for the reader and the writer but try to enforce copyright on the printer and the bookseller. That distinction will no longer work, any more than it would ever have worked in the past on conversation. Those whose livelihood is at stake in copyright do not like that kind of comment. They contend that

creative work must be compensated. Indeed it must But the system must be practical to work in an era of infinitely varied, automated text manipulation there is no reasonable way to count copies and charge royalties on them It may be very unfair to authors. It may have a profoundly negative effect on some aspects of culture, and in any case, whether positive or negative, it may change things considerably. If it becomes more difficult for authors and artists to be paid by a royalty scheme, more of them will seek salaried bases from which to work. Some may try to get paid by personal appearances or other auxiliaries to fame. Or the highly illustrated, well-bound book may acquire a special significance if the mere words of the text are hard to protect. Or one may try to sell subscriptions to a continuing service, These are the kinds of considerations one must think about in speculating about the consequences for culture of a world where the royalty-carrying unit copy is no longer easy to protect in many of the domains where it has been dominant It is clear that with photocopiers and computers, copyright is an anachronism. Like many other unenforceable laws that we keep on the statute books from the past, this one may be with us for some time to come, but with less and less effect (Pool, 1990, pp. 254-59).

The final passages from this rather long quotation suggest the intriguing possibility that, in arguing whether authors “should” have a copyright over their creations, we may be posing what will increasingly become a “moot” question: Technological developments in certain areas—photocopiers, video and sound recording, computer scanning, etc.—are making it harder and harder to enforce the laws. At some point, we might just have to give up (we may have already reached this point in the case of musical recordings), so the interesting question then becomes: What would be the consequences of a world without copyright? Since the main *utilitarian* argument for copyright is that it stimulates literary and artistic creation, the relevant question should be: Would the absence of copyright significantly affect the quality and quantity of literary/artistic output?

- 1) Even today, most authors never make much money writing books, and some actually print their works with their own money. Others are willing to accept payment in copies of their works (often in the form of off-prints of journal articles). Much scientific and academic writing is of this kind. For many of these authors, writing for publication is a way to increase their “brand-name capital,” in order to obtain higher incomes from other activities. Other authors are interested in spreading their views, so they would presumably have no interest in discouraging reproduction of their writings—provided their authorship is acknowledged, they would be quite happy if others were willing to reprint them with their own resources. The output of this type of writing would evidently not be much affected by the absence of copyright.

- 2) A second type of writer does it for a living. If there is no other way to reward them, then the absence of copyright would most likely reduce total literary output. The question is whether copyright is the only way to guarantee an income for this type of writer. Plant (1934b) thought that writers would find a way to sell their product, provided that a demand for it exists at all—note that copyright does not *create* this demand, it only provides a means to *monopolize* a demand once it exists. We cannot know *a priori* what kinds of market structures would dominate in a different legal setting, though possibly (as suggested by Pool) there would be greater reliance on salaried writers for subscription-type publications, perhaps with content more or less “given away” as loss-leaders in order to stimulate sales of other products.¹⁸ Also, as Pool suggested, there might be greater reliance on collateral sources of income, such as personal appearances, lectures, consulting, live performances,¹⁹ etc. Whether alternative market arrangements would fully compensate the loss of income currently derived from copyright is an empirical question. Best-selling writers and composers might very well earn less money in a world without copyright. If so, then the *quantity* of literary and artistic output would most likely be lower. How much lower we cannot know.
- 3) A very ingenious argument proposed by Plant (1934b) suggests that in the case of book publishing, it is likely that the absence of copyright protection would result in a smaller number of *titles* published. This would not necessarily be a bad thing, since what we

¹⁸This is the business model underlying present-day journalism, which essentially hires staff-writers in order to help sell the main product, which is advertising. There are many other examples of this type of arrangement. For instance, early radio broadcasters were subsidized by radio manufacturers, who were willing to lose money on broadcasting in order to stimulate demand for radio sets. Incidentally, it seems to me this is probably how the market would solve the problem of computer software in the absence of copyright. It is often claimed that if software could be copied freely, then software developers would have no incentive to create it. Note, however, that *hardware* manufacturers would have an incentive to support software development (and perhaps even give it away for free), since the availability of more and better software increases the demand for hardware.

¹⁹In the case of music it is interesting to note that, prior to the development of the phonograph, copyright over music applied only to sheet music, i.e., it did not extend to the musical performance. It is an open question whether the gradual extension of copyright to cover not only musical recordings, but *any* kind of public performance, has resulted in increased quantity and quality of musical composition. In any case, if musical recordings could be freely copied (which in practice increasingly happens to be the case now due to the development of “.mp3” computer files), musicians would still have an incentive to compose and record music in order to stimulate the demand for live performances.

really want is not more titles, but more good books at lower prices. Plant argues that the copyright system has a somewhat perverse consequence, in that it encourages publication of a broader range of titles, but not enough copies of the books people really want to read. Due to the nature of his business, a publisher cannot be sure of the success of a new title, and most titles in fact do not cover costs. However, when a title is successful it can be quite profitable, and these profits subsidize losses from unsuccessful titles. Since a publisher cannot know beforehand which new titles will be the successful ones, publishing has some aspects of a lottery: In order to make money on the successful titles, the publisher has to take a chance on many different titles, most of which he knows will be failures. Copyright affects this situation by increasing the profitability of successful titles: In terms of the lottery, copyright protection increases the “prize” without affecting, on the other hand, the risks involved. *Ceteris paribus* we expect that with equal risks, a larger prize will induce a player to buy more “tickets.” Therefore, more *titles* will be published under a copyright system, but the resulting monopoly position guarantees that the books people really want (the successful titles) will be published in smaller quantities and at higher prices.

6. Conclusions.

Issues related to intellectual property rights are becoming increasingly important in policy discussions. Technological developments have created whole new areas of patentable products that pose problems for the definition and delimitation of “property rights”—e.g., computer software and bio-technologies, to mention only two of the most noteworthy areas at the cutting edge of leading technologies (witness the problems involved in “patenting life-forms,” and the question of so-called “internet patents”²⁰). At the same time, some of these very developments are making it harder to enforce many of the more conventional forms of intellectual property—the advent of downloadable “.mp3” computer files, for instance, which raises questions regarding the future viability of copyright in musical

²⁰On “patenting life,” see Barton (1991). As for “internet patents,” note that in October 1999 Priceline.com sued Microsoft’s Expedia group for infringement of its patented “name your own price” auction system, while Amazon.com, the leading Internet book retailer, sued its main rival, Barnes & Noble, for infringement of its patented “one-click” ordering system (Rivette and Kline, 2000, pp. 56, 66).

recordings. The strains and stresses which the newer technologies are imposing on current intellectual property law are resulting in calls for tougher and more stringent enforcement of existing legal mechanisms. The United States government has for several years taken the lead worldwide in pressuring other countries to strengthen their intellectual property laws and make them conform more closely to current U. S. standards.

In view of developments such as these, now is as good a time as any for a radical rethinking of traditional intellectual property concepts. Perhaps, instead of considering reforms to *strengthen* patents and copyrights, we should be moving in the opposite direction? To be sure, given current trends, copyright might well die out on its own, whether we like it or not. If so, discussions of the merits of copyright will become essentially “moot” questions. As for patents, in the absence of precise estimates of the costs and benefits of patent systems, we cannot provide an unequivocal answer to the question posed in the title. Perhaps we will never know for sure. However, we *can* point out that the benefits stressed by the pro-patents camp turn out, on closer inspection, to be smaller than is conventionally assumed, while there are many costs involved that can easily be overlooked. The cost/benefit relationship is thus not as favorable as the pro-patent camp would have us believe. At the very least, we should oppose current efforts to broaden the scope of patent and copyright laws until a stronger case can be made that the benefits do indeed exceed the costs.

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