

# AN ECONOMIC INTERPRETATION OF THE MISAPPROPRIATION DOCTRINE: COMMON LAW PROTECTION FOR INVESTMENTS IN INNOVATION

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*An inventor has an idea for a circuit board design. The board would fit in one of the expansion slots of a widely distributed but somewhat antiquated personal computer model, enhancing its performance and making it competitive with newer and more powerful models. The inventor estimates that \$500,000 would be required to develop the board, including the inventor's lost salary during the development period, and that the boards could be produced and installed at a volume cost of approximately \$100 each. The enhanced performance enabled by the board would have a value of more than \$500 to owners of more than 100,000 units of the personal computer. The inventor calculates that, even using conservative assumptions, this invention could make him rich, if an investor could be found to fund the development. The invention would also benefit a large number of owners of older model personal computers. By providing competition for newer and more powerful personal computers, the invention will lower their prices and indirectly benefit purchasers of those machines as well.*

This free enterprise success story is unlikely to survive the would-be inventor's first discussion with counsel. If the device enjoyed initial success, it would immediately be copied or imitated by a competitor with lower production costs and/or established marketing channels. The market price for the device would quickly drop to the cost of production and distribution plus a normal profit margin. Even if the inventor could survive in the marketplace, he would sell only a relatively small number of units at no more than a normal profit margin which would not be likely to recoup the initial development investment. Faced with this prospect, the inventor is likely to forget the design and learn not to waste his time contemplating such profitless distractions in the future.

This scenario is played out hundreds or thousands of times annually. It has some variants. The inventor may be an individual, a small group, or a large corporation. The range of potential innovations affected is almost limitless and includes products and processes from both the consumer and the capital goods sectors of each industry in which new technology is developed or applied. The abandoned innovation might have resulted in a new product, an improvement in an existing product, or cost savings in producing an existing product.<sup>1</sup> In

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1. In the computer industry alone, the innovation might involve an operating system, application software, a semiconductor chip design, peripheral equipment, other computer aftermarket enhancements, a production method, or a system concept.

some instances, the inventor may proceed with development and only later learn about the consequences of the lack of legal protection for his invention and the ease of imitation by competitors through a subsequent bankruptcy or other unpleasant experience. In others, the inventor may earn a profit in the window between product introduction and successful imitation. The almost unvarying elements of the story are a relatively large investment in product development, lack of effective legal protection for the innovation, relatively low cost for competitors to duplicate the invention, and discouragement and disillusionment of the inventor. The last element entails a considerable social cost.

This scenario is an example of the market defect commonly referred to as "free riding." The thesis of this article is that free riding on the investment of another in high technology innovation should, subject to certain conditions and limitations, constitute an actionable tort, specifically the business tort of misappropriation. Part I of the article describes the nature and consequences of the free rider market defect. Part II describes traditional protection for intellectual property and concludes that it does not eliminate free riding. The historical origins and subsequent application of the tort of misappropriation are traced in Part III. Part IV then outlines a refinement of the tort to protect incentives to invest in high technology innovation. Part V responds to criticisms of and difficulties surrounding application of the doctrine. Specifically discussed are the criticisms that a tort of misappropriation would (1) create inefficiencies in the dissemination and use of technology, (2) grant the inventor an unlimited monopoly in the new product or service, (3) impede social progress by restricting the flow of information and ideas, and (4) be pre-empted by federal statutory schemes. Part VI discusses recent cases to illustrate the application and utility of the misappropriation doctrine.

## I. THE FREE RIDER PROBLEM

### A. The Economics of Innovation

Innovation has become increasingly important in developed economies. It is estimated that more than 71 billion dollars, or 2.6 percent of the gross national product, was expended on research and development in the United States in 1984.<sup>2</sup> An additional 26 billion dollars was expended in Japan.<sup>3</sup> Even these amounts understate the economic significance of innovation. Far greater sums are expended annually on tangible capital goods, such as factories, manufacturing equipment, and commercial transportation than are expended on innovation.<sup>4</sup> While these investments are essential to the continuing production and distribution of goods and services, they alter the status quo relatively little. Minor changes in pricing, quantity, or availability of goods, employment, or

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2. U.S. DEPT. OF COMMERCE, STATISTICAL ABSTRACT OF THE UNITED STATES, 567 (10th ed. 1987).

3. *Id.* at 568, 824.

4. During 1983, investment in fixed tangible goods in the United States totaled \$485.1 billion. 1986 BRITANNICA WORLD DATA ANNUAL 805.

possibly trade are the most common effects of investment in capital goods. In contrast, investments in innovation may drastically affect entire industries, or in extreme cases, even create or destroy them.<sup>5</sup> As Joseph Schumpeter has observed, it is "[t]he competition from the new commodity, the new technology, the new source of supply, the new type of organization, which strikes not at the margins of the profits, and the outputs of the existing firms, but at their foundations and their very lives."<sup>6</sup>

Over time, technical innovation, coupled with the resulting increase in productivity, is a primary determinant of material prosperity.<sup>7</sup> It has even been contended that the fifty-year cycles in global economic activity observable during the Nineteenth and Twentieth centuries, sometimes referred to as Kondratiev waves,<sup>8</sup> are attributable to the periodic creation and destruction of industries by innovation.<sup>9</sup>

Despite the economic importance of innovative activity, it receives scant scholarly attention from economists.<sup>10</sup> This neglect is partly attributable to the lack of useful statistics.<sup>11</sup> It is also partly methodological. Economists have traditionally treated innovation and invention not as endogenous, but as exogenous to the market economy.<sup>12</sup> The reason for such treatment may be historical. At the time the early economists were writing, technology had not assumed a paramount importance in the economy and technological research and development was not specialized.<sup>13</sup> The rate of technological change was thus

5. For example, process innovations have rendered whole generations of steel factories obsolete and the development of the airplane supplanted substantially all passenger rail traffic and most inter-city bus travel over the course of a few decades.

6. J. SCHUMPETER, *CAPITALISM, SOCIALISM AND DEMOCRACY* 84 (1932). Schumpeter was an influential and controversial economist and social observer during the first half of the Twentieth Century. See P. SAMUELSON & W. NORDHAUS, *ECONOMICS*, 803-04 (12th ed. 1985). Schumpeter argued, *inter alia*, that the traditional view of competition had been antiquated by the pace of technological development and that monopolies should supplant competition in order to facilitate the development and utilization of new technologies. *Id.* at 540. Although few of his specific predictions have been borne out empirically, his observations and hypotheses have spawned decades of critical inquiry. *Id.* at 541.

7. Real income per capita in the United States quadrupled between 1869 and 1953, while per capita input of capital and labor increased by only 14%. J. MINASIAN, *The Economics of Research and Development*, in NATIONAL BUREAU OF ECONOMIC RESEARCH, *THE RATE AND DIRECTION OF INVENTIVE ACTIVITY* 93 (1962). Minasian's hypothesis is that "productivity increases are associated with investment in the improvement of technology and the greater the expenditures for research and development the greater the rate of growth of productivity." His nonrandom sample of productivity and research expenditures in the chemical industry bore out this hypothesis. *Id.*, at 94, 140-41.

8. Nikolai Kondratiev, a Russian economist, postulated the occurrence of such "megacycles" during the 1920s. C. FREEMAN, *THE ECONOMICS OF INDUSTRIAL INNOVATION* 208 n.1 (2d ed. 1982).

9. See *id.* at 207-11.

10. *Id.* at 3-4.

11. G. WYATT, *THE ECONOMICS OF INVENTION* 27-28, 37 (1986) (research output from inventive activity is not susceptible to direct measurement).

12. *Id.* at 147-50 (tracing the developing economic scholarship establishing the roles of supply and demand in influencing inventive activity, based largely on the work of Jacob Schmookler). An exogenous variable is one supplied independently or externally, like weather. An endogenous variable, such as employment or output, responds dynamically to changes in economic policy and other factors.

13. For example, Adam Smith treats machine and product improvements not as the task of specialized scientists or engineers, but as the province of the workmen who use them. See generally A. SMITH, *AN INQUIRY INTO THE NATURE AND CAUSES OF THE WEALTH OF NATIONS* ch. I (R.H. Campell, A.S. Skinner & W.B. Todd rev. eds. 1976) (1776).

far slower than at present. The few studies devoted to the economics of innovative activity have focused on various macroeconomic<sup>14</sup> concerns, such as industrial concentration and market structure, the technological environment, the degree of product differentiation in the industry, the growth rate of the industry, and the level of governmental involvement.<sup>15</sup>

## B. Incentives for Innovation

One of the functions of the common law is to establish and maintain appropriate incentives for investment.<sup>16</sup> This role is particularly active and important with respect to intangible rights such as intellectual property.<sup>17</sup> As a useful starting point for the analysis presented in this article, the protection of incentives for investment in tangible property will be discussed first.

For example, a firm<sup>18</sup> might consider an investment in a factory. If the investment results in the ability to make better or cheaper products or otherwise satisfies some consumer demand, the products will sell, and the firm will receive more revenue. If this revenue exceeds the cost of production, the firm will earn income; if the income is sufficient, the firm earns a profit.<sup>19</sup> Thus, profit is both the incentive for the original investment and evidence that consumer welfare has been enhanced. Investments that are excessive in light of the consumer demand, such as the third gas station at an intersection, generate economic

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14. Macroeconomics involves the study of an entire economy or large sectors of an economy in terms of output, productivity, trade, price level, and other similarly broad indicia. Microeconomics involves the study of the behavior of individual consumers and firms, as both producers and consumers of goods and services, in response to existing and changed incentives, conditions, and other stimuli.

15. See, e.g., G. Wyatt, *supra* note 11, at 150; Bosworth, *Technological Environment, Market Structure and Investment in Technological Change*, in *THE ECONOMICS OF TECHNOLOGICAL PROGRESS* 151-75 (T. Puu & S. Wiebe eds. 1980) (applying a model of the relationship between research and development and technology transfers to data from industries in the United Kingdom).

16. Cf. R. POSNER, *ECONOMIC ANALYSIS OF LAW* 30 (3d ed. 1986) (protection of property rights encourages efficient resource use).

17. The term "intellectual property" is used herein to refer to commercial information, concepts, inventions, or ideas. Its use does not represent an unstated assumption that "intellectual property" is, strictly speaking, a form of "property." See *E.I. DuPont de Nemours Powder Co. v. Masland*, 244 U.S. 100, 102 (1917) (Holmes, J.) (noting that the term "property" applied to trademarks and trade secrets is an "unanalyzed expression" of the fact that the law requires good faith in those areas). Neologisms such as "trade values" have not gained currency. See Note, 9 *ARIZ. L. REV.* 315 (1967) (defining "trade values" to include products, ideas, trade secrets, goodwill, names, and symbols).

18. A "firm" as defined in economics is any unit that operates as an individual economic entity that purchases and consumes labor, material, and capital, and produces and sells goods and services. It may be anything from an individual proprietorship to a multi-national corporation in structure and size.

19. A "profit" in an economic, as opposed to an accounting, sense means that revenues exceed expenses, including the normal return on the capital invested. See F. SCHERER, *INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE* 269 (2d ed. 1980); E. MANSFIELD, *PRINCIPLES OF MICROECONOMICS* 344-46 (3d ed. 1980). In this article, "profit" will be used in its economic sense; "income" will be used when an accounting profit is intended. To illustrate, additional income of \$1,000 on an additional investment of \$1,000,000 might be an accounting profit but an economic loss.

losses. Firms are thus "led by an invisible hand"<sup>20</sup> to an "efficient" level of investment in tangible capital goods.<sup>21</sup>

The law plays a simple and passive role with respect to investments in tangible property. The investor or his agents can maintain exclusive physical possession of tangible capital goods and the resulting products. The legal system need only recognize and protect this physical possession against trespass or theft.

Intellectual property differs from tangible capital goods in that use of intellectual property is not inherently exclusive. Unless the law assigns rights in an idea and imposes some restrictions on its use, once it is revealed it can be simultaneously used by all who learn of it, whether they contributed to its creation or not.

When an innovation can be imitated without restriction, the price of a product or service having incorporated the imitated innovation does not reflect all of the development cost. The imitator expends only the cost of imitation which is far smaller than that of innovation. The initial investment is therefore lost as a factor in the market pricing mechanism.<sup>22</sup> For example, a factory may emit fumes that damage the finish of some cars. Assuming no practical private cause of action, this production cost will not be reflected in the price of the resulting product. This is referred to as a negative externality. Externalities may also be positive. For example, an apiary may pollinate a nearby orange grove, a benefit not reflected in the price of either the honey or the oranges. Absent legal restriction, an imitator free rides on the investment of the original inventor, sharing in the benefits of the innovation without incurring the cost of development.<sup>23</sup> Firms have no economic incentive to consider costs or benefits that accrue to unrelated third parties in planning the firms' activities.<sup>24</sup> As a result, a firm may make decisions that, although rational in light of its own costs and benefits, would be inefficient if all costs and benefits were considered.<sup>25</sup>

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20. "[B]y directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention." A. Smith, *supra* note 13, ch. II, at 456.

21. "Efficient" is used in the economic sense of maximizing consumer welfare. See R. POSNER, *supra* note 16, at 9 (resources employed efficiently on uses where value to consumers highest).

22. Costs that are not reflected in the market price of a product are sometimes referred to as "unpriced factors." See E. MISHAN, *WELFARE ECONOMICS* 103-04 (1964).

23. Free riding occurs where some person or firm bears some cost or reaps some benefit as a result of the economic activity, without any contractual or other voluntary relationship with the creator of that cost or benefit. Using the example above, the polluter free rides on those who bear the costs (whether monetary or aesthetic) of pollution, and the orange grower on the beekeeper's investment and effort in maintaining the apiary.

24. A firm may be guided by noneconomic factors such as a love of nature. Allowing such factors to have a substantial influence on decision making, however, can have negative implications for the survival of the firm. See R. POSNER, *supra* note 16, at 395 (assuming that firms are guided only by economic incentives).

25. The factory in the example above might continue production even though the cost of its pollution exceeds its profit. Conversely, the apiary might be unable to remain in business on the revenue generated from the sale of its honey, even though the combined value of the honey and the uncompensated pollination services would be sufficient.

Absent legal protection from free riding, a prudent and ordinarily risk averse<sup>26</sup> investor generally would assume that imitation would occur and without significant delay. In a fragmented and competitive industry, numerous firms would be able to engage in imitation. The price of a product incorporating the innovation would then be the cost of production and distribution for the imitations, plus a normal return on the investment in imitation. The actual innovator's rate of return on the incremental investment in innovation, after the period prior to successful imitation, would be zero. Similarly, a cost-lowering process innovation for an existing product would generate economic profits to the inventor only so long as it remained exclusive or nearly so. Once imitation became widespread, it would be reflected in a lower supply curve, and the lower price would negate the lower costs to the producer. The net economic effect is under-investment in innovative activity, with a resulting loss of the social benefits from the innovations that do not occur.

The economic motivation to engage in free riding is substantial. Appropriation of intellectual property is cheaper than innovation. It is far easier for a skilled and knowledgeable observer to understand and duplicate what he is observing than it is to develop it independently. Companies in such fields as software, peripheral equipment, communications, and biotechnology are intensely competitive and imitative.<sup>27</sup> Lawsuits for alleged copyright infringement, various species of unfair competition, breaches of covenants not to compete, antitrust violations, and the like are regular occurrences. Indeed, industrial espionage, though surely not an everyday occurrence, remains as a method for discovering the intellectual property of a competitor.<sup>28</sup>

The principal social loss, however, is not free riding on existing innovations. In economic terms, the phenomenon of free riding represents a transfer payment from the innovator to the imitator, a payment that has no direct

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26. "Risk" in economics has two elements. First, it refers to the probability that the return on an investment by an individual will deviate from the "normal" result. It also refers to the magnitude of such possible deviations. The risk of investing in treasury bonds is thus very small, because both the interest and the principal are exactly known and the probability of default is insignificant. See P. SAMUELSON & W. NORDHAUS, *supra* note 6, at 657. The risk of investing in a common stock is higher, because the dividend and market price may fluctuate significantly. "Risk neutrality" is complete indifference to risk. A risk neutral person would have no preference between a 100% chance of receiving \$500,000 and a 50% chance of receiving \$1,000,000. In substantial matters, however, people are generally risk averse. *Id.* at 658. They demand a higher expected rate of return for higher risk than for lower risk investment. As applied here, one significant risk factor in a prospective investment in innovation is the possibility of imitation. The normal risk averse investor will tend to overestimate this risk, making the prospect of imitation a greater disincentive to investment than the objective probability of imitation might warrant.

27. As one example of free riding, an entire industry has developed around "cloning" IBM Personal Computers. A similar "cloning" industry almost certainly would have developed around Apple computers but for an aggressive and expensive legal campaign. This campaign is described in *Apple, Unlike IBM, Fends Off Imitators by Aggressively Taking Them to Court*, Wall St. J., Dec. 4, 1986, § 2, at 37, col. 4.

28. For example, Hitachi reportedly paid IBM \$300 million to settle an action for an alleged plot to obtain stolen material concerning certain IBM system software. *IBM Settled Hitachi Ltd. Lawsuit After a Secret \$300 Million Accord*, Wall St. J., Nov. 9, 1983, § 1, at 3, col. 1. See also *Putting a Lid on Corporate Secrets*, N.Y. Times, Apr. 1, 1984, § 3, at 1, col. 2 (theft of trade secrets of pacemaker manufacturer).

economic significance. The principal social loss is the expectation of future free riding and the resulting disincentive to new investment that free riding creates.

The magnitude of that loss is difficult if not impossible to study empirically.<sup>29</sup> The extent to which free riding has reduced investment in innovation therefore must be addressed essentially *a priori*. The "window" between the introduction of an innovation and the onset of competition from appropriators is a complicating factor in the analysis. Only during that period can the investor anticipate earning some return on the incremental investment in innovation. Empirical evidence suggests that dissemination of an innovation throughout an industry is sometimes a slow process.<sup>30</sup> This evidence, however, comes from mature, heavily capitalized industries, such as coal and steel.<sup>31</sup> The pace of innovation and imitation in emerging high technology industries is observably faster. Unless the prospective investor could predict with reasonable certainty that the period required to imitate a successful and unprotected innovation would be lengthy,<sup>32</sup> he would rationally choose not to invest.<sup>33</sup> A cautious or risk averse investor, lacking complete information, would naturally assume that competitors would imitate a new development without significant delay.

Incentives for innovation are further skewed by the extensive protection afforded patentable innovations. A patent grants the inventor complete exclusivity for seventeen years.<sup>34</sup> In contrast, without a common law remedy, a prospective investor in an unpatentable innovation only has the hope that his competitors will not appropriate his innovation too quickly. This massive disparity in protection skews investment decisions. Regardless of the relative total benefits to consumers, an investor is strongly motivated to invest in

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29. The phenomenon that would need to be quantified, a decision not to invest, is a non-occurrence. There are no hard data to be studied relating to such non-occurrences. A survey intended to elicit such information would be of little utility, involving contrary-to-fact speculation as to how much more would have been invested in research and development if imitation of the results of that investment were prohibited.

30. See F. SCHERER, *supra* note 19, at 444-45 and studies cited therein.

31. *Id.* at 445 n.22.

32. There is no *a priori* sufficient "period." A lead time of six months might be enough to earn back a small investment in an active market with short purchasing cycles. Two years might not be enough if the research and development investment were large compared to the average sale and if the purchasing cycle were long. Whatever the duration of the period, marginal cases would be presented. For example, an initial investment might be justified if competitors delayed one year then independently derived an innovation (or licensed technology from the original innovator), but not if competitors delayed one year then appropriated the innovation without payment.

33. This Article assumes that prospective inventors will generally respond to economic disincentives by decreasing or eliminating their investment in innovation. It has been urged that: "the race of contrivers and inventors does obey an inborn and irresistible impulse. Schemes and experiments begin in childhood, and persist so long as life and strength hold. It matters not whether a fortune is made or pecuniary distress is chronic." F. TAUSSIG, *INVENTORS AND MONEY-MAKERS* 21 (1930). However accurate this may be as a description of human nature, it appears almost quaint when applied to the business of investing in innovation. Even routine product improvements frequently require the investment of man-years of effort or the financial equivalent thereof. These investment decisions are primarily made by business persons and managers, not by "contrivers and inventors." Most patents are now issued to businesses rather than to individuals. F. SCHERER, *supra* note 19, at 440. Businesses in high technology fields are quite capable of resisting, or at least redirecting, the human impulse to contrive and invent when the likely profits do not justify the required investment.

34. 35 U.S.C. § 154 (1984).

patentable rather than in unpatentable innovations so that any resulting profits would accrue solely to the benefit of the investor. A common law remedy that discourages free riding would shift this balance and redirect investments in innovation toward more efficient use.

An additional social cost of free riding is that many inventors resort to trade secrecy, which restricts use of the innovation.<sup>35</sup> Many technological developments may be commercially utilized to a far greater extent if they can be disclosed than if they need to be concealed. For example, new equipment for geophysical mapping might be used only to perform surveys, thereby keeping the innovation secret, or disclosed through manufacture and sale to oil and mining concerns. The manufacture and sale of the equipment would clearly disseminate the technology more rapidly and would therefore confer greater social benefits. However, an innovator might elect to maintain the innovation as a trade secret by selling only surveying services and retaining control of the equipment. Such restrictions on the use of an innovation after its development represent an additional social cost of free riding.

### C. Prior Judicial Treatment of Free Riding

This article addresses free riding in the context of intellectual property law. There is prior judicial support for the desirability of eliminating free riding to encourage efficient investment in information. In *Continental T.V., Inc. v. GTE Sylvania Inc.*,<sup>36</sup> the Supreme Court addressed vertically-imposed territorial restrictions on resale, previously held to be *per se* unlawful in *United States v. Arnold, Schwinn & Co.*<sup>37</sup> The Court overruled *Schwinn*, noting that vertical territorial restrictions on the sale of a product may encourage retailers "to make the kind of investment of capital and labor that is often required in the distribution of products unknown to the consumer." These services might not be provided by retailers absent such restrictions because of the free rider effect.<sup>38</sup> The Court thus found that the potential for eliminating or reducing free riding was a sufficient justification for changing its own rule of substantive law.<sup>39</sup> Concern about free riding also has figured significantly in another context. Both the

35. See *infra*, notes 63-64 and accompanying text.

36. 433 U.S. 36 (1977) (applying the Sherman Act, 15 U.S.C. § 1).

37. 388 U.S. 365, 379 (1967).

38. 433 U.S. at 55. Cf. *Sandura Co. v. Federal Trade Comm'n*, 339 F.2d 847, 852 (6th Cir. 1964) (closed distributor territories permissible under Federal Trade Commission Act to encourage distributors to undertake advertising without possibility of the other distributors reaping the benefits of advertising).

39. Commentators of the Chicago School have urged that resale price maintenance is similarly capable of discouraging free riding and should therefore not be unlawful *per se*. E.g., Posner, *The Rule of Reason and the Economic Approach: Reflections on the Sylvania Decision*, 45 U. CHI. L. REV. 1, 6-9 (1977). The contention is that retailers would be willing to offer efficient pre-sale services if the manufacturer enforced resale price maintenance to prevent discounters from free riding on those services and undercutting the retailers' prices. This argument, however, is flawed. A rational discounter confronted with resale price maintenance would continue to free ride on pre-sale services offered by other retailers and would, instead of undercutting the retail price, simply provide a higher level of post-sale services, such as extended free warranty services or cheap financing. The Court's reluctance to modify the *per se* rule against resale price maintenance thus has a strong, if perhaps unappreciated, economic justification.

National Labor Relations Act<sup>40</sup> and the Railway Labor Act<sup>41</sup> authorized so-called union or agency shop arrangements. Under such arrangements, although union membership cannot be made a condition of employment, the non-member employee can be required to pay union dues. The Supreme Court has upheld such arrangements against First and Fourteenth Amendment challenges.<sup>42</sup> The Court has reasoned that, absent such compulsory dues, non-members could free ride on the collective bargaining efforts of the union financed by union members.<sup>43</sup> Consistent with that rationale, non-members are required to contribute only the portion of union dues devoted to collective bargaining, grievance procedures, and similar activities, and not the portion directed toward organizing, litigation, and political purposes.<sup>44</sup>

The free rider problem can be summarized briefly. Intellectual property, unlike tangible assets, cannot be physically possessed to the exclusion of others. The risk of appropriation by others discourages some efficient investments in innovation. As a result, some socially beneficial inventions or developments do not occur or are delayed. The traditional legal protection for innovations must therefore be analyzed for its ability to prevent free riding.

## II. TRADITIONAL FORMS OF PROTECTION

Intellectual property is subject to several well established forms of protection, notably patent, copyright, and trade secrets law.<sup>45</sup> It might be suggested that this existing protection is sufficient. In practice, limitations on the scope of these protections leave large gaps through which significant, efficient, and socially beneficial innovations fall.

### A. Patent

The elements of patentability are novelty,<sup>46</sup> utility,<sup>47</sup> and non-obviousness.<sup>48</sup> The most common impediment to patentability is obviousness. The statutory standard is whether "the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."<sup>49</sup> This issue is resolved by

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40. See 29 U.S.C. § 158(a)(3) (1937).

41. See 45 U.S.C. § 152 (1926).

42. See, e.g., *Abood v. Detroit Bd. of Educ.*, 431 U.S. 209 (1977); *International Ass'n of Machinists v. Street*, 367 U.S. 740 (1961).

43. *Abood*, 431 U.S. at 221-22; *N.L.R.B. v. General Motors Corp.*, 373 U.S. 734, 740-43 (quoting legislative history of National Labor Relations Act); *Street*, 367 U.S. at 761 (quoting legislative history of Railway Labor Act). A union, as exclusive bargaining representative, cannot withhold representation from non-members. *Id.* at 760-61.

44. *Ellis v. Brotherhood of Railway Employees*, 466 U.S. 435, 448-55 (1984); *Abood*, 431 U.S. at 233-36.

45. Trademark and related protections designed to prevent source confusion are wholly distinct from the coverage of the doctrine of misappropriation and therefore are not discussed.

46. 35 U.S.C. § 101 (1952).

47. 35 U.S.C. § 102 (1952).

48. 35 U.S.C. § 103 (1952).

49. 35 U.S.C. § 103 (1952).

determining the scope and content of the prior art, ascertaining the differences between the prior art and the patent claims, and evaluating the level of ordinary skill in the pertinent art.<sup>50</sup> Inquiries concerning such "secondary considerations" as the commercial success of the invention, the period of time during which the need for the invention has been perceived but unsatisfied, and the failures of others in attempting to develop the same invention "may be relevant."<sup>51</sup>

These factors admittedly provide no sure test for obviousness.<sup>52</sup> On many patent applications, the examiner might reasonably resolve the issue either way, a decision which is then subject to second-guessing by the courts.<sup>53</sup> Much turns on this determination. The patent system provides the inventor of a non-obvious invention seventeen years of exclusivity, even against independent derivation. This is in sharp contrast to the inventor of an "obvious" invention who receives no protection at all from the patent system. Such great disparity of results seems disproportionate to potentially minor intrinsic differences in the respective efforts involved or in the inventions themselves.

Other inventions are not close calls. Applying the standards outlined in the statute and in *Graham v. John Deere*, most innovations are "obvious" and therefore receive no protection under the patent law. This lack of protection should not be construed as a flaw in the patent system. A system that awarded extended exclusivity with respect to all innovations, regardless of their significance, would be highly inefficient and probably unworkable. Nevertheless, many require substantial investments to develop and confer significant social benefits. Thus, although long term exclusivity may be unwarranted, some form of protection is necessary in order to maintain proper incentives.

## B. Copyright

Copyright protection extends to "original works of authorship fixed in any tangible medium of expression."<sup>54</sup> The formalities for securing protection are few.<sup>55</sup> Copyright, however, protects only the form of expression and does not "extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery."<sup>56</sup> This restriction originated in *Baker v. Selden*.<sup>57</sup> The dichotomy between idea and expression is, in practice, frequently a matter of degree and difficult to apply as a test of copyrightability.<sup>58</sup>

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50. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1965).

51. *Id.* at 17-18.

52. "What is obvious is not a question upon which there is likely to be uniformity of thought in every given factual context." *Id.* at 18.

53. The Patent Office has generally been much more willing to find an invention patentable than the courts. "We have observed a notorious difference between the standards applied by the Patent Office and by the Courts." *Id.*

54. 17 U.S.C. § 102(a) (1976).

55. See 17 U.S.C. § 401-12 (1976).

56. 17 U.S.C. § 102(b) (1976).

57. 101 U.S. 99 (1879).

58. See generally *Nichols v. Universal Pictures Corp.*, 45 F.2d 119 (2d Cir. 1930) (L. Hand).

As a result of this limitation, copyright protects only a few kinds of innovative activity.<sup>59</sup> The issue has arisen frequently in recent years in connection with efforts to protect computer software. It is now well established that software, in whatever form, is within the subject matter of copyright.<sup>60</sup> The extent of the protection thus afforded, however, turns on the application of the distinction between idea and expression. Some courts have found that the structure and overall organization of a program are part of its expression and therefore deserving of copyright protection.<sup>61</sup> Others have regarded such aspects of the program as part of its idea or concept.<sup>62</sup> Unfortunately, the distinction between idea and expression is completely irrelevant to the need for incentives for investment in innovation. Each type of endeavor requires a substantial investment that is unlikely to occur absent some protection against appropriation.

### C. Trade Secrets

The most important traditional form of common law protection for intellectual property is trade secrets law. The widely accepted definition of a trade secret is:

Any formula, pattern, device or compilation of information which is used in one's business, and which gives him an opportunity to obtain an advantage over competitors who do not know or use it. The subject matter of a trade secret must be secret . . . so that, except by the use of improper means, there would be difficulty in acquiring the information.<sup>63</sup>

The important element to the current discussion is secrecy. Most courts require only relative or qualified, but not absolute, secrecy.<sup>64</sup> Even relative secrecy, however, is not achievable with respect to many innovations. For example, innovations that result in new products or in product improvements frequently must be disclosed in order to be exploited commercially. New manufacturing processes, on the other hand, may sometimes be maintained as trade secrets. Thus, trade secrets protection provides incentives for some kinds of innovation, but not others, and skews investment accordingly. More

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59. See, e.g., *Esquire, Inc. v. Ringer*, 591 F.2d 796 (D.C. Cir. 1978) (outdoor lighting fixtures not protected by copyright because shape had "an intrinsic utilitarian function"); *Norris Industries, Inc. v. International Telephone and Telegraph Corp.*, 696 F.2d 918 (11th Cir. 1983).

60. See, e.g., *Williams Electronics, Inc. v. Artic Int'l, Inc.*, 685 F.2d 870 (3d Cir. 1982) (infringement of plaintiff's copyrights on audio visual works and a computer storage program relating to electronic video game); *Apple Computer, Inc. v. Formula Int'l, Inc.*, 725 F.2d 521 (9th Cir. 1984).

61. *Whelan Associates, Inc. v. Jaslow Dental Laboratory, Inc.*, 797 F.2d 1222 (3d Cir. 1986) (copyright protection of structure and ordering of computer program); *accord*, *Broderbund Software v. Unison World, Inc.*, 648 F.2d 1127 (9th Cir. 1986); see also *SAS Institute, Inc. v. S&H Computer Systems, Inc.*, 605 F. Supp. 816, 830 (M.D. Tenn. 1985) (preparation of a derivative work); *Atari, Inc. v. North American Phillips Consumer Electronics Corp.*, 672 F.2d 607 (7th Cir. 1982) (similarity of audio visual display); Comment, *Protecting the "Look and Feel" of Computer Software*, 1 HIGH TECH. L.J. 411 (1986).

62. See *Plains Cotton Cooperative Ass'n of Lubbock, Texas v. Goodpasture Computer Service, Inc.*, 807 F.2d 1256 (5th Cir. 1987); *Synercom Technology, Inc. v. University Computing Co.*, 462 F. Supp. 1003 (N.D. Tex. 1978).

63. RESTATEMENT OF TORTS § 757, comment b (1939).

64. See, e.g., *K-2 Ski Co. v. Head Ski Co., Inc.*, 506 F.2d 471 (9th Cir. 1974).

fundamentally, secrecy, whether relative or absolute, bears no relationship to the social utility of the innovation or the need for incentives. Indeed, in most cases, an innovation is more beneficial to the public if disclosed than if concealed. Thus, trade secrets protection creates incentives which are contrary to efficient operation of the economy.

### III. DEVELOPMENT OF THE MISAPPROPRIATION DOCTRINE

Patent, copyright, and trade secrets law thus do not protect many of the products of innovative activity. Free riding remains a threat to innovations that are obvious (within the meaning of the patent law), the value of which is not (or not primarily) in their form of expression, and that cannot be commercially exploited in secrecy. If unrestricted, the threat of such free riding will deter much of the investment and activity that is necessary to the development of such innovations.

The law can remedy the economic ill-effects of free riding by forcing imitators to take into account the true cost of the innovation in their pricing. This, in turn, can be accomplished by prohibiting imitators from appropriation of an inventor's work. The legal theory for this prohibition is the doctrine of misappropriation.

#### A. The *INS v. AP* Decision

The Supreme Court's decision in *International News Service v. Associated Press*<sup>65</sup> is credited with giving birth to the misappropriation doctrine in the United States.<sup>66</sup> International News Service (INS) had been using various means to obtain news stories from its competitor, Associated Press (AP). The sole issue in the case was the propriety of copying such stories from bulletin boards and early editions of AP's eastern newspaper affiliates, then transmitting them to the western United States for use by INS's affiliates, in competition with AP.<sup>67</sup> The news stories were not protected by copyright. INS urged that, absent copyright protection, AP's news could be protected "only by being kept secret and confidential" and that, after publication, the news could be used by any person for any purpose.<sup>68</sup> Despite considerable discussion concerning "property" in news, the Court recognized that the issue was whether INS's conduct constituted unfair competition.<sup>69</sup> The Court reasoned that the nature of news

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65. 248 U.S. 215 (1918) (hereinafter *INS v. AP*).

66. The following discussion of *INS v. AP* and its progeny is not intended to be comprehensive. Its only purpose is to provide background and context to the discussion that follows. These cases have been frequently and exhaustively explicated. See, e.g., Abrams, *Copyright, Misappropriation, and Preemption: Constitutional and Statutory Limits of State Law Protection*, 1983 SUP. CT. REV. 509; Baird, *Common Law Intellectual Property and the Legacy of International News Service v. Associated Press*, 50 U. CHI. L. REV. 411 (1983); Denicola, *Trademarks as Speech: Constitutional Implications of the Emerging Rationales for the Protection of Trade Symbols*, 1982 WIS. L. REV. 158; Mitchell, *Misappropriation and the New Copyright Act: An Overview*, 10 GOLDEN GATE U.L. REV. 587 (1980).

67. *INS v. AP*, 248 U.S. at 232.

68. *Id.* at 233.

69. *Id.* at 235.

precluded AP from protecting it through secrecy.<sup>70</sup> The Court then gave a fair description of the free rider problem confronted by AP:

Not only do the acquisition and transmission of news require elaborate organization and a large expenditure of money, skill, and effort; not only has it an exchange value to the gatherer . . . ; but also, as is evident, the news has an exchange value to one who can misappropriate it.<sup>71</sup>

The Court upheld the preliminary injunction entered by the lower court, stating that INS's news piracy would:

divert a material portion of the profit from those who have earned it to those who have not; with special advantage to defendant in the competition because of the fact that it is not burdened with any part of the expense of gathering the news. The transaction speaks for itself, and a court of equity ought not to hesitate long in characterizing it as unfair competition in business.<sup>72</sup>

Justices Holmes and Brandeis dissented. Justice Holmes would have permitted INS to use AP's news as long as it gave credit to AP as the source.<sup>73</sup> He argued the traditional view that unfair competition is primarily concerned with source confusion, sometimes referred to as "palming off." Justice Brandeis would have denied all relief to AP.<sup>74</sup> He stated that any protection for fresh news would need to emanate from Congress.<sup>75</sup>

## B. Subsequent Application

The misappropriation cause of action developed in *INS v. AP* has been decidedly a doctrine of fashion. It disappeared intermittently for periods of several years, only to reappear when the courts confronted a recurrent fact pattern that appeared to demand relief but fell outside of traditional forms of intellectual property protection. In 1924, five years after *INS v. AP*, a state court applied the doctrine to prevent a hotel from placing covers over telephone directories which obscured advertising sold by the publisher with advertising sold by the hotel.<sup>76</sup> Misappropriation was also the basis for a federal court's holding that radio stations could not paraphrase stories from local newspapers and read them over the air.<sup>77</sup>

*INS v. AP* ceased to have controlling authority in 1938 as a result of *Erie Railroad v. Tompkins*,<sup>78</sup> but the doctrine survived. State and federal courts have since applied it in a wide variety of situations, such as to prevent publishers of

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70. *Id.*

71. *Id.* at 238.

72. *Id.* at 240.

73. *Id.* at 246-48.

74. *Id.* at 248-67.

75. *Id.* at 267.

76. *National Telephone Directory Co. v. Dawson Mfg. Co.*, 214 Mo. App. 683, 263 S.W. 483 (St. Louis Ct. App. 1924).

77. *Associated Press v. KVOS, Inc.*, 80 F.2d 575 (9th Cir. 1935), *rev'd for want of juris*, 299 U.S. 269 (1936); *Veatch v. Wagner*, 116 F. Supp. 904 (D. Ala. 1953); *Pottstown Daily News Publishing Co. v. Pottstown Broadcasting Co.*, 411 Pa. 383, 192 A.2d 657 (1963).

78. *Erie R.R. v. Tompkins*, 304 U.S. 64 (1938) (abolishing federal common law for use by federal courts in deciding state law questions).

trade papers from using information printed in other newspapers,<sup>79</sup> to prohibit the publishing of answers to textbook problems,<sup>80</sup> to protect against the appropriation of fictional or dramatic characters,<sup>81</sup> to provide a right of publicity (before such a right otherwise existed),<sup>82</sup> to prevent the copying of fashion designs,<sup>83</sup> to prohibit the interception of radio signals,<sup>84</sup> to prohibit the use of established financial indices as a basis for new forms of investment instruments,<sup>85</sup> to protect owners of recordings from piracy by competitors,<sup>86</sup> and to prevent unauthorized broadcasting of entertainment events.<sup>87</sup>

Although all decided under the misappropriation rubric, these cases are by no means uniform in their analyses. The doctrine most commonly is formulated in three elements: (1) investment by the plaintiff in the creation of a product, (2) use by the defendant of the product in competition with the plaintiff, and (3) resulting commercial damage to the plaintiff.<sup>88</sup> Other cases, including the recent cases involving stock indices,<sup>89</sup> have omitted the element of competition between the plaintiff and the defendant. The more expansive interpretations of the doctrine tend to be based on either the preservation of "fairness"<sup>90</sup> or the punishment of some form of improper conduct.<sup>91</sup> Some of these cases seem to revel in the amorphousness of the doctrine as thus "defined."<sup>92</sup> The consistent

79. *Bond Buyer v. Dealers Digest Publishing Co.*, 25 A.D. 2d 158, 267 N.Y.S.2d 944 (1966); *McCord Co. v. Plotnick*, 108 Cal. App. 2d 392, 239 P.2d 32 (1951).

80. *Addison-Wesley Publishing Co. v. Brown*, 207 F. Supp. 678 (E.D. N.Y. 1962).

81. *Lone Ranger, Inc. v. Cox*, 124 F.2d 650 (4th Cir. 1942). *But see* *CBS, Inc. v. DeCosta*, 377 F.2d 315, *cert. denied*, 389 U.S. 1007 (1967).

82. *Madison Square Garden Corp. v. Universal Pictures Co.*, 255 A.D. 459, 7 N.Y.S.2d 845 (1938).

83. *Dior v. Milton*, 155 N.Y.S.2d 443 (1956). *But see* *Fashion Originators Guild v. FTC*, 114 F.2d 80 (2d Cir. 1940); *Cheney Bros. v. Doris Silk Corp.*, 35 F.2d 279 (2d Cir. 1929).

84. *KMLA Broadcasting Corp. v. Twentieth Century Cigarette Vendors Corp.*, 264 F. Supp. 35 (C.D. Cal. 1967).

85. *Standard & Poor's Corp. v. Commodity Exchange, Inc.*, 683 F.2d 704 (2d Cir. 1982); *Board of Trade of City of Chicago v. Dow Jones & Co., Inc.*, 108 Ill. App. 3d 681, 439 N.E.2d 526 (1982).

86. *A&M Records, Inc. v. M.V.C. Distributing Corp.*, 574 F.2d 312 (6th Cir. 1978); *Capitol Records, Inc. v. Mercury Records*, 221 F.2d 657 (2d Cir. 1955); *CBS, Inc. v. Melody Recordings, Inc.*, 134 N.J. Super. 368, 341 A.2d 348 (1975); *GAI Audio of N.Y., Inc. v. CBS, Inc.*, 27 Md. App. 172, 340 A.2d 736 (1975); *Mercury Record Prods., Inc. v. Economic Consultants, Inc.*, 64 Wis.2d 163, 218 N.W.2d 705 (1974). *But see* *RCA Mfg. Co., Inc. v. Whiteman*, 114 F.2d 86 (2d Cir. 1940).

87. *Metropolitan Opera Ass'n v. Wagner-Nichols Recorder Corp.*, 101 N.Y.S.2d 483 (1950) (copies of radio broadcasts); *Waring v. WDAS Broadcasting Station, Inc.*, 327 Pa. 433, 194 A. 631 (1937) (radio broadcast of a recording not licensed for radio); *National Exhibition Co. v. Fass*, 143 N.Y.S.2d 767 (Sup. Ct. 1955) (piracy of radio broadcast of baseball game); *Mutual Broadcasting System v. Muzak Corp.*, 30 N.Y.S.2d 419 (1941) (appropriation of broadcast of World Series); *Pittsburgh Athletic Co. v. KQV Broadcasting Co.*, 24 F. Supp. 490 (W.D. Pa. 1938).

88. *E.g.*, *Mercury Record Prods. Inc. v. Economic Consultants, Inc.*, 64 Wis.2d at 163, 218 N.W.2d at 709; *Videotronics, Inc. v. Bend Electronics*, 564 F. Supp. 1471, 1476 (D. Nev. 1983); *Schuchart & Assoc. v. Solo Serve Corp.*, 540 F. Supp. 928, 943-44 (W.D. Tex. 1982).

89. *See supra* note 79; *see also* *Bond Buyer*, 267 N.Y.S.2d at 946.

90. *E.g.*, *Madison Square Garden Corp. v. Universal Pictures*, 7 N.Y.S.2d 845, 852-53 (1938); *Board of Trade of the City of Chicago v. Dow Jones & Co., Inc.*, 108 Ill. App. 3d 681, 439 N.E.2d 526, 537 (1982).

91. *Roy Export Co. Establishment of Vaduz, Lichtenstein v. Columbia Broadcasting System, Inc.*, 672 F.2d 1095, 1105 (2d Cir.), *cert. denied*, 459 U.S. 826 (1982) (punishing "commercial immorality").

92. "The tort is adaptable and capacious." *Id.* at 1105.

theme in these cases is not analytical but factual and circumstantial: the doctrine is pressed into service as a basis for establishing rights and relations concerning emerging industries or technologies that are somehow excluded from the protections of better established and more circumscribed doctrines.<sup>93</sup> The doctrine continues to exist,<sup>94</sup> but lacks a consistent formulation or direction.

#### IV. AN ECONOMIC FORMULATION OF THE MISAPPROPRIATION DOCTRINE

The objective of this section is to better define the misappropriation doctrine so as to direct it toward advancing economic efficiency,<sup>95</sup> specifically, toward providing incentives for a proper level of investment in the research and development of marketable innovations.<sup>96</sup> The ultimate economic issue (*i.e.*, whether the plaintiff would have been discouraged from investing in research and development if he had known the defendant would imitate him) cannot be presented directly to the trier of fact. The contentions in the resulting swearing contest between the parties would be speculative, and the results would be unpredictable. Moreover, the sample of cases would be biased, being necessarily limited to instances in which the plaintiff had decided to proceed with development. The many cases in which a would-be inventor does not proceed with development represent the greatest social cost, but these would never be brought before a court. Therefore, the courts must develop an objective definition of the elements that induce free riding and thus discourage efficient investment in research and development. These elements are the following: a substantial investment by the plaintiff in innovation; appropriation of the innovation by the defendant; and use by the defendant of the appropriated innovation in competition with the plaintiff.

93. This "gap filling" development of the doctrine was noted in *United States Golf Association v. St. Andrews Systems, Data-Max, Inc.*, 749 F.2d 1028, 1035 (3d Cir. 1984).

94. *See supra* notes 79-87. Nevertheless, a number of reported decisions include statements or holdings that are facially inconsistent with the misappropriation doctrine, but which fail to distinguish, discuss, or even mention it. In *Smith v. Dravo Corp.*, 203 F.2d 369, 375 (7th Cir. 1953), for example, the court states that "[i]t is unquestionably lawful for a person to gain possession, through proper means, of his competitor's product, and, through inspection and analysis, create a duplicate, unless, of course, the item is patented." Unless there is an unstated and meaningful distinction between information in the form of news published in Eastern newspapers and design information "published" in a competitor's product, this unsupported assertion is flatly inconsistent with *INS v. AP*. Neither *INS v. AP* nor the doctrine it originated, however, is discussed or even mentioned in the opinion. Other cases include similarly unqualified abnegations of any power to fashion a remedy for free riding, also without discussion of the apparent conflict with the misappropriation doctrine. *E.g.*, *Norwich Pharmacal Co. v. Sterling Drug, Inc.*, 271 F.2d 569 (2d Cir. 1959); *Irizarry y Puente v. President & Fellows of Harvard College*, 248 F.2d 799 (1st Cir. 1957). These cases are perhaps best understood as adopting, *sub silentio*, Judge Learned Hand's suggestion that *INS v. AP* be confined to "situations substantially similar to those then at bar." *Cheney Bros. v. Doris Silk Corp.*, 35 F.2d at 280. Judge Hand's view was ultimately rejected by the Second Circuit in *Capitol Records, Inc. v. Mercury Records Corp.*, 221 F.2d 657 (2d Cir. 1955).

95. Much of the common law can be explained or rationalized as being directed toward promoting economic efficiency. *See R. POSNER, supra* note 16, at 229-31.

96. The result will admittedly not be consistent with all reported decisions concerning the doctrine. Given the inconsistent objectives and approaches previously endorsed by the courts, any definition is in accordance with some cases and contrary to others.

### A. Substantial Investment by the Plaintiff

The first element of a *prima facie* misappropriation claim is a substantial investment by the plaintiff in the development of the information, concept, or invention at issue.<sup>97</sup> The doctrine is intended to protect and encourage this investment, up to the level of economic efficiency. Courts should consider only the investment in research or development, not the investment in tooling, marketing, or manufacturing.<sup>98</sup> All of these latter costs would necessarily be borne by any subsequent competitor. If the competitor is more efficient in those areas, the original inventor likely will not succeed, and should not. It is only the investment on which a competitor could free ride that is material.

The investment may be in the form of money or of lost opportunity cost. However, it must be substantial. A trivial or insignificant "investment" does not involve the kind of investment decision based upon costs and potential reward that would be affected by the prospect of free riding.<sup>99</sup> The substantiality of the investment would depend upon the magnitude of the market for the product. A \$50,000 investment in product development, for example, would be very large for a product with a \$500,000 market, but trivial for a \$100,000,000 market.

The intellectual property may be manifested in a product, a process, or an approach. The only requirement is that it be related in some way to function. Attributes such as color, form, names, or marks identify the source of a product or service rather than constitute, define, or enhance a product or service. These are protected, if at all, by trademark or copyright. Misappropriation is directed against free riding, not source confusion.

### B. Appropriation by the Defendant

The second element of a *prima facie* misappropriation claim is appropriation of intellectual property by the defendant. "Appropriation" as used here means extracting or learning of plaintiff's intellectual property other than by independent efforts or by contract with the plaintiff. The defendant might accomplish such appropriation by hiring or paying plaintiff's employees or former employees, by acquiring plans or other documentary descriptions, or by "reverse engineering" a product by dismantling and copying it. Independent derivation of a product that performs precisely the same function as plaintiff's is not appropriation, even if the independently derived product is coincidentally identical to plaintiff's. To illustrate, a company might develop a process for creating a new form of polymeric foam. A competitor who examines the foam and independently derives a process that exactly duplicates it would not be liable for misappropriation. Conversely, appropriation may occur even though the

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97. It has previously been recognized that intellectual property protection is at least as much directed toward encouraging investment as toward encouraging invention. See, e.g., *SCM Corp. v. Xerox Corp.*, 463 F. Supp. 983, 997 (D. Conn. 1978).

98. See Kitch, *The Nature and Function of the Patent System*, 20 J. OF L. & ECON. 265, 276 (1977).

99. An invention, however insignificant the investment, may be patentable or may be protected by common law (e.g., if revealed in confidence). The insignificance of the investment affects only the misappropriation remedy.

plaintiff's product is not exactly or completely copied. For example, a defendant may appropriate plaintiff's design by extracting and using a few key elements, then substitute his own ideas for the remainder. At some point, an appropriation might become *de minimis* and not warrant any remedy. However, courts should not reach such a conclusion too readily in the face of evidence showing that the defendant thought it worth his while to extract what was available from plaintiff's work.

Several observations concerning the appropriation element are pertinent. First, it is intended to distinguish free riding from mere competitive innovation, thereby forcing competitors to internalize the costs of innovation. A defendant who appropriates intellectual property utilizes the plaintiff's investment in developing that intellectual property for his own benefit, gaining competitive advantage and discouraging similar investments by others. Independent derivation may be harmful to the plaintiff competitively, but it is not free riding. Second, this element distinguishes misappropriation from patent protection. Independent derivation is not a defense to a patent infringement action.<sup>100</sup> Third, under this definition of appropriation an invention does not diminish another's freedom of action, viewed *a priori*.<sup>101</sup> A would-be inventor has precisely the same privilege and ability to invent a particular product, whether another inventor has previously done so or not; his only "loss" is the inability to accelerate the process by free riding on the first inventor's product. Indeed, the success of one inventor in designing a certain product aids rival would-be inventors by demonstrating that a certain result is possible.<sup>102</sup> The reception of the original product in the market may also provide immensely valuable information to prospective competitors.<sup>103</sup> Finally, proof of appropriation<sup>104</sup> obviates any inquiry into the comparative ease or expense of innovation and imitation. If the defendant believed that independent derivation were cheaper than imitation, he would simply develop the innovation from scratch. There is no apparent reason to require that the plaintiff prove that defendant's assessment of the relative costs of innovation and imitation is correct.

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100. See 35 U.S.C. § 271(a) (1984).

101. This result may not be significant economically, but courts contemplating the declaration of a somewhat controversial right should find it comforting. It may also circumvent certain philosophical conundra associated with a generalized prohibition of free riding. See R. NOZICK, *ANARCHY, STATE AND UTOPIA* 94-95 (1974). An economically significant corollary to this point is that the doctrine of misappropriation is highly unlikely to create any genuine, long-term market power. See *infra* notes 142-147 and accompanying text.

102. In a sense, competitors are thus allowed to free ride on the investment in determining that a particular result can be achieved. In rare instances, this more limited free ride might create material disincentives to efficient investment. Prohibiting the use of such knowledge, however, would stifle competitive innovation, create exclusive rights in numerous small product niches, and completely obviate patent law. It is thus evident that this market defect is not susceptible to correction.

103. See generally Kitch, *supra* note 98, at 277.

104. Proof of appropriation is discussed *infra*, Part IV(E).

### C. Use in Competition with the Plaintiff

The third element of a *prima facie* claim for misappropriation is use by the defendant of the appropriated intellectual property in competition with the original inventor. This requirement is based upon the assumption that a possible use of an innovation by others would not discourage a would-be inventor from investing in product development, as long as that use did not directly affect the product's commercial success for the inventor. The inventor depends on a return on his investment from the product he develops, not from unanticipated off-shoots into other markets. On the other hand, the social benefits of allowing such noncompetitive use may be significant. To illustrate, a leak and rupture resistant design for a helicopter fuel system might embody intellectual property which would be useful in designing a new crash-resistant fuel system for automobiles. The helicopter manufacturer presumably would not be discouraged from pioneering such ideas because of their possible use in the automotive industry, and automobile purchasers would benefit from the use. The same concept may sometimes apply within a single industry. For example, a design concept appearing in a personal computer "mother board" might prove to have considerable utility in the development of a file server.

In common with the two elements outlined above, the element of use in competition with the plaintiff is intended to focus the misappropriation remedy on free riding that discourages efficient investment in research and development. This element also distinguishes misappropriation from patent protection. Use of a protected invention in competition with the patentee is not an element of a patent infringement action.<sup>105</sup>

### D. Other Possible Elements or Defenses

#### 1. *Absence of Alternative Forms of Protection*

One of the reasons for recognition of the tort of misappropriation is the failure of traditional intellectual property approaches, primarily patent, copyright, and trade secrets, to protect against free riding in many situations.<sup>106</sup> Where other forms of protection are or were available, it could be argued that a misappropriation claim should not lie. Several consequences militate strongly against such a restriction.

First, the "availability" of another form of protection would frequently pose difficult issues relating only tangentially to the merits of the action. Disputes over patentability are commonplace.<sup>107</sup> The seminal cases establishing copyright protection for computer programs in their various forms have all been

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105. 35 U.S.C. § 271(a) (1984).

106. *See infra*, Part IV(A).

107. In 1985 alone, 1,155 patent infringement actions were commenced in federal district courts. ANNUAL REPORT OF THE DIRECTOR OF THE ADMINISTRATIVE OFFICE OF THE U.S. COURTS, app. I, at 21 (June 30, 1986).

decided within the last decade, over vigorous opposition.<sup>108</sup> Significant cases concerning the scope of copyright protection for intellectual property are reported each year.<sup>109</sup> Determining the availability, after the fact, of trade secrets law as a method of protecting a concept that, *ex hypothesi*, has already been revealed and misappropriated would present the jury with a contrary-to-fact hypothetical issue for resolution. At best, inquiries along such lines would be time consuming, expensive, and speculative; at worst, they would be perverse.<sup>110</sup>

Second, another form of protection might not be efficacious. A patentable invention, for example, might have commercial value for only a brief period. The average period required to process a patent application exceeds two years.<sup>111</sup> If an alternative form of protection is not sufficient to deter free riding, the rationale for a misappropriation remedy remains.

A third and closely related point is that an alternative form of protection might not be preferable or even desirable socially. For example, an inventor might choose not to disclose his invention during the pendency of a patent application in order to avoid "cream-skimming" by imitators.<sup>112</sup> After a patent is issued, the exclusivity granted the inventor may lead to inefficient restrictions on output.<sup>113</sup> An inventor, intending to rely on trade secrets, may encapsulate chips, encipher data, or otherwise expend money or effort to maintain the secrecy of his innovation. Alternatively, as noted above, the invention may simply not be made available in certain markets or applications because secrecy would be compromised. In these and many other instances, the inventor is responding rationally to the scope of, and gaps in, traditional forms of protection. Each of these responses is detrimental to the interests of consumers. A predictable cause of action for misappropriation would eliminate or reduce the incentive to maintain secrecy or otherwise to restrict the availability of an innovation because disclosure would not invite free riding. Under such circumstances, courts should not discourage reliance upon the misappropriation doctrine in deference to alternative forms of relief.

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108. *Apple Computer, Inc. v. Formula International Inc.*, 725 F.2d 521 (9th Cir. 1984); *Apple Computer, Inc. v. Franklin Computer Corp.*, 714 F.2d 1240 (3d Cir. 1983), *cert. denied*, 104 S. Ct. 690 (1984); *Williams Electronics, Inc. v. Artic Int'l, Inc.*, 685 F.2d 870 (3d Cir. 1982).

109. *See, e.g., Whelan Associates, Inc. v. Jaslow Dental Laboratory*, 797 F.2d 1222 (3d Cir. 1986) (protection of structure of software); *Atari, Inc. v. North American Phillips Consumer Electronics Corp.*, 672 F.2d 607 (7th Cir. 1982) (visual copyright).

110. A defendant might, for example, prevail on the ground that an invention was original, novel, non-obvious; indeed, a product of brilliant insight and years of hard work, and could have secured patent protection or been kept as a trade secret. These very facts, of course, also present the strongest case for discouraging free riding by recognition of a misappropriation claim.

111. As of September, 1983, the average time between the filing of a patent application and the issuance or abandonment of a patent was 25.5 months. 1983 COMMISSION OF PATENT AND TRADE-MARKS ANNUAL REPORT 46.

112. Another social cost of the patent system is sometimes referred to as the "near miss" loss. Two inventors, working independently, may develop the same invention at about the same time. The first receives a patent; the second is excluded from competition. The patentee may then enjoy some economic power, with resulting higher prices to consumers and diminution of the consumer surplus, while the competitor is excluded from the use of his own, independent invention. Under the misappropriation doctrine, and specifically the appropriation element, both inventors could exploit the invention, resulting in a more competitive market.

113. *See, e.g., W. BOWMAN, PATENT & ANTITRUST LAW* 3 (1979).

Finally, the availability of an alternate form of protection provides no affirmative reason for excluding a misappropriation remedy. Overlapping causes of action are commonplace throughout the law. The misappropriation doctrine complements traditional remedies by preserving incentives for innovative activities without granting potentially inefficient exclusivity against independent invention. Even where a misappropriation remedy overlaps with alternative protections, use of the misappropriation remedy is not harmful. Therefore, and in light of the strong countervailing considerations discussed above, the availability of alternative forms of protection should not be an issue in a misappropriation case.<sup>114</sup>

## 2. Plaintiff's Failure to Protect Itself by Contract

The possibility of restricting the misappropriation cause of action to claims against third parties initially appears to merit serious consideration. In many instances, the inventor discloses intellectual property to others with whom he has contractual relations, such as suppliers, customers, employees, or independent contractors. In most instances, it is an employee who develops the intellectual property. The employee may then depart and attempt to compete with his former employer using information which he developed, in whole or in part, on the former employer's behalf. In these instances, the employer could protect its prospective investment in intellectual property by advance contract. Arguably, *post hoc* application of the misappropriation doctrine circumvents a negotiation process which might more efficiently allocate intellectual property rights among the parties. The failure to obtain contractual protection might, by the same argument, suggest that the risk of free riding was not such as to deter the investment in the development of the innovation. However, this argument depends heavily on assumptions concerning the subjective understandings of the parties. Failure to prohibit free riding by contract could well reflect the assumption of one or both parties that the common law prevents free riding absent an agreement to the contrary.<sup>115</sup> Attempting to determine the parties' assumptions after the fact would be unedifying, given the parties' then diametrically opposed interests in the outcome of the issue. The better approach is to create the cause of

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114. The Supreme Court rejected "partial pre-emption" of state trade secrets law insofar as it protects patentable inventions on the basis of very similar reasoning in *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470 (1974). See *infra* Part V(E) (discussing preemption).

115. Such an assumption would not be without basis. First, the misappropriation cases themselves provide some support for this assumption. In addition, it has been held that a former employee has a duty not to use information gained during his employment in competition with his former employer, even though the same information could have been gleaned from an inspection of publicly available information or material. *E.g.*, *Smith v. Dravo Corp.*, 203 F.2d 369 (7th Cir. 1953) ("the mere fact that such lawful acquisition is available does not mean that [a former employee] may, through a breach of confidence, gain the information in usable form and escape the efforts of inspection and analysis"). See also *Goldberg v. Medtronic, Inc.*, 686 F.2d 1219, 1226-27 (7th Cir. 1982); RESTATEMENT (SECOND) OF AGENCY §395 comment b, § 396 (1958). Ironically, these authorities suggest that relief should be denied when there is not a prior contractual relationship between the parties, the precise opposite of the result suggested by the present argument. The author's own experience (albeit with a biased sample) is that one or both parties will frequently assume that information learned in the course of employment cannot be used in competition with the former employer, notwithstanding the absence of any express contractual undertaking to that effect.

action to establish generally correct incentives, subject to contractual adjustment by the parties for unusual circumstances.<sup>116</sup>

## E. Some Practical Considerations

### 1. Proof

Direct proof of appropriation is often not available. More often, the trier of fact must infer appropriation from circumstantial evidence.<sup>117</sup> The scope of such permissible inferences has been litigated in other fields of intellectual property.

In copyright litigation, for example, an inference of copying can be drawn from proof that (1) defendant had access to the copyrighted work, and (2) the infringing work is "substantially similar" to the copyrighted work.<sup>118</sup> In the most general terms, works are substantially similar if the defendant's work includes isolated portions that are literal or verbatim copies of the copyrighted work or if there is a comprehensive, though non-literal, similarity between the works.<sup>119</sup> Taking of a trade secret can also be shown by circumstantial evidence.<sup>120</sup> Similarities in product, process, or design may support an inference of taking by the defendant, particularly if similarities are found with respect to arbitrary or defective features of the plaintiff's product.<sup>121</sup> Marketing by defendant of a product incorporating the trade secret after an implausibly short development period may also support an inference of taking.<sup>122</sup> The same kinds of circumstantial evidence would be equally probative in proving misappropriation.

Circumstantial proof of appropriation, however, is not dispositive. Similarities between the plaintiff's and the defendant's products may be coincidental; unusually rapid development may be the product of inspiration or hard work. The ultimate issue is "appropriation;" that is, whether the defendant obtained intellectual property from the plaintiff without authorization, or derived it independently. Notwithstanding apparently probative circumstantial

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116. See R. POSNER, *supra* note 16, at 45.

117. The evidence in *INS v. AP* was somewhat atypical. AP planted a story about a fictitious Russian named "Nelotsky" ("stolen" spelled backwards with an ending added for Russian flavor), which then appeared in INS-affiliated newspapers. E. KITCH & H. PERLMAN, *LEGAL REGULATION OF THE COMPETITIVE PROCESS* 34 (2d ed. 1979).

118. 3 M. NIMMER, *COPYRIGHT* § 13.01[B] (1987).

119. *Id.* at § 13.03.

120. R. MILGRIM, *MILGRIM ON TRADE SECRETS* § 7.07[1] (1986).

121. *E.g.*, *Structural Dynamics Research Corp. v. Engineering Mechanics Research Corp.*, 401 F. Supp. 1102, 1117 (E.D. Mich. 1975).

122. *E.g.*, *Space Aero Products Co. v. R.E. Darling Co.*, 238 Md. 93, 208 A.2d 74 (1965), *cert. denied*, 382 U.S. 843 (1965).

evidence, the defendant may always prove independent derivation<sup>123</sup> or otherwise negate the inference of appropriation.<sup>124</sup>

## 2. Remedies

*INS v. AP* established that injunctive relief is available for misappropriation. The Supreme Court upheld an injunction against use of the plaintiff's news "until its commercial value as news to the [plaintiff] ha[d] passed away."<sup>125</sup> This is consistent with the practice in trade secret cases, in which successful plaintiffs commonly obtain injunctive relief.<sup>126</sup>

The appropriate duration of injunctive relief is a frequent source of controversy. The most common form of injunction in trade secret cases continues for the period of time required for independent development<sup>127</sup> and is sometimes referred to as a "lead time" injunction. Other decisions have upheld perpetual injunctions.<sup>128</sup> *INS v. AP* is ambiguous in this respect. The injunction in that case, although limited in duration, covered by its terms the entire period during which plaintiff's intellectual property would have had any commercial utility. A lead time injunction may be adequate to protect the plaintiff's investment, but it likely would not cause the defendant to internalize the true cost of the innovation; despite having to wait, the defendant gets the innovation free. A perpetual injunction may therefore be preferable if it is narrowly drawn to prohibit only appropriation. The defendant may then derive the innovation independently, rendering the injunction effectively moot after the actual development period passes. If, on the other hand, the injunction must be drawn more broadly to avoid circumvention, or if knowledge appropriated from the plaintiff is so widely disseminated in defendant's organization that independent derivation is impracticable, a lead time injunction may be appropriate. Thus, the scope and duration of injunctive relief should be tailored to the facts of the case.<sup>129</sup>

An award of damages is also appropriate in a misappropriation action.<sup>130</sup> At a minimum, the plaintiff can recover profits lost as a result of business diverted by defendant's misappropriation.<sup>131</sup> If the extent of diversion cannot be proven, either the defendant's profits or a reasonable royalty for the

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123. This is not an unrealistic or impractical burden. Documentation of experiments and other development efforts, including failed ones, is a standard and accepted practice among scientists and engineers. Such documentation would provide ample proof of independent invention.

124. See *Droeger v. Welsh Sporting Goods Corp.*, 541 F.2d 790, 792-93 (9th Cir. 1976) (defendant's employees with access to plaintiff's trade secrets kept insulated from development of competing product).

125. 248 U.S. at 245-46.

126. R. MILGRIM, *supra* note 120, at § 7.08[1] (1986).

127. *Id.*

128. *Data General Corp. v. Digital Computer Controls, Inc.*, 357 A.2d 105 (Del. Ch. 1975).

129. See *Brunswick Corp. v. Outboard Marine Corp.*, 79 Ill. 2d 475, 404 N.E.2d 205 (1980) (trade secrets).

130. *E.g.*, *GAI Audio, Inc. v. Columbia Broadcasting System, Inc.*, 27 Md. App. 172, 340 A.2d 736, 750 (1975).

131. *Id.*

involuntary license of plaintiff's innovation may be an appropriate measure. Each measure has been applied in some circumstances in trade secret actions.<sup>132</sup>

## F. Summary of the Elements

The tort of misappropriation as here defined consists of three elements: plaintiff's significant investment in innovation; defendant's appropriation of the results; and defendant's use of the innovation in competition with plaintiff.<sup>133</sup> These elements represent all of the conditions necessary for free riding to occur, with its resulting social costs. Conversely, if any one of these conditions is absent, free riding is not likely to be a threat. More precisely, economically efficient investments in innovation are not likely to be discouraged by the threat of free riding.

## V. CRITICISMS OF THE DOCTRINE

### A. Allocative Inefficiencies

Prohibiting appropriation encourages efficient levels of investment in technology, but it also threatens to create inefficiencies in the dissemination and use of that technology. Faced with the threat of a misappropriation action, a competitor who becomes aware of a useful innovation might direct its employees to reinvent the innovation or forego its use altogether. If the innovation represents a cost-saving or product improvement, the failure of competitors to use it would represent a social loss. On the other hand, reinvention usually would be a needless expenditure of resources.<sup>134</sup> More constructively, the competitor could simply appropriate the original invention and spend the time saved in developing improvements. There are several responses to this argument.

First, the argument against requiring reinvention ignores, rather than addresses, the free rider problem. Free riding discourages investments necessary for innovation, with the result that there are no inventions to imitate. Consumers are better off with the benefits of an innovation that a competitor chooses to reinvent than they would be with no innovation at all.

Second, a lack of protection does not avoid these allocative inefficiencies. Rather, it creates a powerful incentive to patent inventions whenever possible,

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132. *E.g.*, *USM Corp. v. Marson Fastener Corp.*, 392 Mass. 334, 467 N.E.2d 1271, 1276-77 (1984) (defendant's profits as alternative measure); *Metallurgical Industries Inc. v. Fourtek, Inc.*, 790 F.2d 1195, 1208 (5th Cir. 1986) (reasonable royalty); *University Computing Co. v. Lykes-Youngstown Corp.*, 504 F.2d 518, 536-47 (5th Cir. 1974); *San Manuel Copper Corp. v. Redmond*, 8 Ariz. App. 214, 445 P.2d 162, 168-69 (1968) (reasonable royalty absent an appropriate measure, absent willful appropriation).

133. Although the objective of this formulation is normative rather than positive, it should be noted that these elements are consistent with the most common formulation of the misappropriation doctrine. See *supra* note 88.

134. Reinvention will not always represent a social loss. A subsequent inventor who, *ex hypothesi*, is not slavishly copying the original innovation may develop a better, cheaper, or otherwise more efficient innovation than the original.

thereby delaying use and reinvention, and to keep unpatentable innovations secret,<sup>135</sup> thereby virtually foreclosing their dissemination.

Most importantly, licensing of an invention is more likely than widespread non-use or reinvention. This point requires a brief discussion of the "Coase Theorem."<sup>136</sup> This theorem was developed in the context of negative externalities,<sup>137</sup> but the analysis applies equally to the free rider problem at issue here. The Coase Theorem states that externalities do not give rise to a misallocation of resources provided that there are no transaction costs and that property rights are well defined and enforceable without cost. The reasoning is that the parties affected by the externality will have the proper incentives to negotiate an economically efficient solution. Take the example of a pond, in which one neighboring property owner raises fish and which the other neighboring property owner pollutes. If the law recognizes a property right in clean water, and the activity causing the pollution is more valuable than the fish-raising, the polluter will buy the right to pollute, using a portion of his profits, which is the efficient result.<sup>138</sup>

The application of Coase's Theorem to the free rider problem is relatively straightforward. Assume that a competitor of an original innovator would have sufficient use for a new invention to justify the cost of independent derivation. Instead of independent derivation, he would seek to acquire a non-exclusive license to the invention from its inventor for some amount not exceeding the anticipated cost of that derivation. Knowing that his competitor will, if a license is refused, simply attempt to reinvent the innovation, the innovator has every incentive to grant a license and reap some benefit.<sup>139</sup> Thus, the wasted expense of reinvention is avoided. The transfer payment from the competitor to the innovator, whatever its magnitude, is of little economic significance.

The utility of the Coase Theorem as applied to typical negative externalities, such as air pollution, has been challenged on the ground that such situations are characterized by large numbers of affected persons and prohibitive transaction costs.<sup>140</sup> Licensing of technological innovations also entails some transaction costs, but not in nearly the same degree. After an innovation is introduced in a product or service, prospective competitor-licensees are almost self-defining; they are the ones who, absent a license, will direct their employees to duplicate the invention. The prospective licensee would also likely know without cost the identity of the innovator (unlike, for example, in the problem

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135. R. Posner, *supra* note 16, at 36.

136. The Coase Theorem was named after Ronald Coase, who developed the theorem in his pathbreaking article, Coase, *The Problem of Social Cost*, 3 J. L. & ECON. 1 (1960).

137. For a discussion of negative externalities, see *supra* Part I(B).

138. Conversely, if a right to pollute were recognized and fish-raising were the more valuable activity, the fish-raiser would purchase a contractual undertaking from the polluter not to pollute, also the efficient result.

139. See Kitch, *supra* note 98, at 279 (similar conclusion with respect to patent licenses). This conclusion is supported by observation. Licensing and cross-licensing of innovations protected by patent in some high technology fields is so widespread as to be routine. See, e.g., *The Wall Street Journal*, Feb. 13, 1987, at 27, col. 1.

140. See the discussion in Polinsky, *Controlling Externalities and Protecting Entitlements: Property Right, Liability Rule, and Tax-Subsidiary Approaches*, 8 J. OF LEG. STUD. 1, 3 (1979).

of pollution). The only uncertainty that would seem to require investigation would be whether the innovation was in the public domain (for example, if it was disclosed in an expired patent), so that a competitor would not need to secure a license. Such information presumably would be known or readily available to competitors with a working knowledge of the art. Thus, the market would likely consist of one or a few sellers and a few buyers with considerable knowledge of each other and the product. Such markets are characterized by very low transaction costs.

## B. Creation of Monopoly Power

Some contend that recognizing a cause of action for misappropriation would be tantamount to legal enforcement of a monopoly in favor of the developer of a new product or service, without the time limitations or the restrictions contained in the patent and copyright laws.<sup>141</sup> This argument is flawed at several levels.

First, few innovations confer monopoly power, even temporarily. Most "new" products or services face preexisting competition. They are merely improvements or superior alternatives to existing products or services. The innovator usually will confront a market with competitive pricing among the existing alternatives. This is one reason why most patents confer no significant economic power on the patentee.<sup>142</sup> Estimates show that less than 20 percent, and perhaps as few as five percent, of all patents have any commercial value at all.<sup>143</sup>

Second, when competitors enter the market they erode the innovator's original market power.<sup>144</sup> Therefore, to maintain meaningful economic power the innovator needs some effective barrier to entry to exclude future competition. A barrier to entry is a cost of production that must be borne by new entrants but not by established firms.<sup>145</sup> If competitors are able to enter the market with the same long-term costs, the established firm cannot charge prices significantly above a competitive level for any extended period.<sup>146</sup> An unpatented

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141. See *Sears, Roebuck & Co. v. Stiffel Co.*, 376 U.S. 225, 232-233 (1964); see also letter of July 27, 1976 from Michael M. Uhlmann, Assistant Attorney General, Legislative Affairs, to Congressman Robert Kastenmeier, Chairman, Subcomm. on Courts, Civil Liberties, and the Administration of Justice, Comm. on the Judiciary (July 27, 1976). Abrams, *supra* note 66, at 545-47, reprinted in LAW JOURNAL PRESS, *THE COPYRIGHT ACT OF 1976: DEALING WITH THE NEW REALITIES*, 177-92 (1976) (concerning Copyright Act of 1976, asserting that "imitation is the life-blood of competition" and referring to the misappropriation doctrine as "highly anticompetitive"). The position of the Justice Department has changed considerably in the intervening decade. See the remarks of Charles F. Rule, Deputy Assistant Attorney General (now Chief), Antitrust Division, on Aug. 12, 1986, to a joint meeting of the Antitrust and the Patent, Trademark, and Copyright Sections of the American Bar Association. 55 ANTITRUST L.J. 365 (1986) (recognizing, *inter alia*, that excluding third parties from using intellectual property protects incentives for investments in research and development by preventing free riding). *Id.* at 367-68.

142. Kitch, *Patents: Monopolies or Property Rights?*, 8 RES. IN L. & ECON. 31, 33-34 (1986).

143. National Bureau of Economic Research, *The Rate and Direction of Inventive Activity*, 164 (1962).

144. See R. POSNER, *supra* note 16, at 261-262.

145. G. STIGLER, *THE ORGANIZATION OF INDUSTRY* 67 (1968).

146. In a perfectly competitive environment, price at equilibrium equals marginal cost at the minimum average total cost. P. SAMUELSON, *ECONOMICS* 480 (12th ed. 1986). A perfectly competi-

innovation is not likely to be an effective barrier to entry, even though protected by the misappropriation doctrine. A competitor or potential competitor is free to derive the same innovation independently. Competitors should be able to independently derive the innovation at the same or lower cost than the innovator.<sup>147</sup> Therefore, although a useful innovation may temporarily allow the inventor to earn profits above a normal, competitive level, the availability of a misappropriation remedy is unlikely to confer any significant long-term economic power on the inventor, much less create a monopoly.

Finally, any limited economic power conferred by prohibiting misappropriation of an innovation is socially more beneficial than the non-development of the innovation.<sup>148</sup> Even an innovation resulting in a pure monopoly generates some consumer surplus, albeit less than in a competitive market.<sup>149</sup> Any departure from pure monopoly pricing toward competitive pricing merely enlarges this surplus.

### C. Interference with Social Progress

An underlying consideration concerning any form of intellectual property protection is whether the restriction on the flow of ideas threatens the advance of knowledge. Civilization progresses by using the existing stock of knowledge and adding to it, not by reinventing existing knowledge; we reach higher by standing on the shoulders of our predecessors. These observations do not militate against a misappropriation remedy as prescribed here.

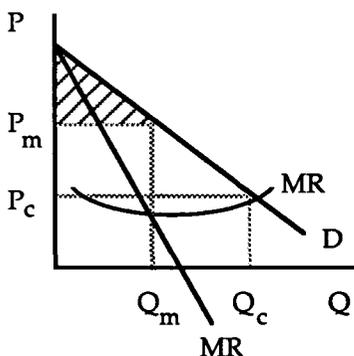
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tive market, however, will rarely be at equilibrium. A firm, due to temporary competitive advantages, including a useful innovation, may be able to charge prices above this competitive level. Indeed, it is this premium which justifies the initial investment in the innovation. This is, however, a non-equilibrium position. The temporary premium provides the incentive for entry and innovation by other firms, which pushes prices in the direction of the equilibrium ideal.

147. See *supra* notes 102-03.

148. See Cheung, *Property Rights and Invention*, 8 RES. L. & ECON. 5, 10 (1986) (similar analysis concerning patent protection).

149. An elaborate proof of the statement in the text is contained in Usher, *The Welfare Economics of Invention*, 31 ECONOMICA 278, 279-87 (1964). The result can be depicted graphically (and simplistically) as follows:



Where D is the demand curve, MR is the monopolist's marginal revenue curve, and MC is the monopolist's marginal cost curve. The monopolist will produce units so long as its marginal revenue (the net revenue from the last unit produced) exceeds its marginal cost (the cost of the last unit produced). The price of these units (PM) is determined by the demand curve. The portion of the demand curve above that price level represents consumers to whom the product was worth even more than the monopoly price. The shaded triangle represents the total consumer surplus, that is, the total amount by which the value of the product to all purchasers exceeds its cost. Because the innovation is virtually certain to confront some close substitutes in the short term and additional competition in the long term, some pricing lower than the monopoly price, approaching the competitive price, will most often be charged, either as a result of conscious limit pricing or in response to market pressures.

First, progress requires that an innovation occur before it can be imitated. Widespread appropriation without compensation undercuts this unstated assumption.

Second, the doctrine of misappropriation as here defined is limited to competitive use of intellectual property. It thus affects only commercial applications. Political, social, religious, and other noncommercial ideas generally considered to be at the heart of social progress are unaffected.

Third, the sole restriction on appropriating intellectual property is the prohibition of its use in competition with the person whose investments made the innovation possible. Thus, the doctrine does not restrict transferral of the idea to some other application. Such "cross-fertilization" is a frequent source of progress. Conversely, products or services incorporating the innovation in its original application are available from the innovator or his licensees. At worst, the benefits of the idea resulting from that application would be somewhat more expensive than if unrestricted imitation were permitted. This higher price in a limited area would not appear to represent a threat to the advance of knowledge.

Finally, as noted above,<sup>150</sup> the doctrine of misappropriation presupposes voluntary transferrability of the protected intellectual property. A license could be obtained to permit competitive use of an innovation in conjunction with a socially important addition or improvement. A profit-maximizing investor would have a strong incentive to license the intellectual property to such a competitor, who could then make more efficient use of the original innovation.<sup>151</sup>

#### D. Preemption

Misappropriation is a doctrine of state law. After *Sears, Roebuck & Co. v. Stiffel Co.*<sup>152</sup> and *Compco Co. v. Day-Brite Lighting Inc.*,<sup>153</sup> there was cause for concern that state law protection of intellectual property would be preempted<sup>154</sup> by the federal statutory intellectual property schemes. More recent decisions, however, have substantially lessened that concern.<sup>155</sup>

In *Sears* and *Compco*, the Supreme Court reviewed state law decisions finding unfair competition in the copying of certain aesthetically appealing

150. See *supra* Part V(A) (discussing the Coase Theorem).

151. R. POSNER, *ECONOMIC ANALYSIS OF LAW* 271-72 (3d ed. 1986).

152. 376 U.S. 225 (1964).

153. 376 U.S. 234 (1964).

154. Notwithstanding considerable loose language suggesting otherwise, the issue, precisely stated, is not one of preemption, but of the consistency of particular state law causes of action with the objectives of the federal statutes. The distinction is set forth in *Hines v. Davidowitz*, 312 U.S. 52, 67 (1941). In some fields, such as labor, "where the federal government . . . has enacted a complete scheme of regulation . . . states cannot . . . conflict or interfere with, curtail, or complement, the federal law, or enforce additional or auxiliary regulations." *Id.* at 66-67. In fields which are not preempted, the issue under the Supremacy Clause, is whether a state law would "stand as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress." *Id.* at 67.

155. See *infra* notes 158-172. The following discussion is intentionally abbreviated. For a thorough treatment of *Sears*, *Compco*, and the later cases see *Abrams*, *supra* note 66, at 509.

lighting fixtures. The Supreme Court reversed in a sweeping and largely undeveloped opinion by Justice Black.

[W]hen an article is unprotected by a patent or a copyright, state law may not forbid others to copy that article. To forbid copying would interfere with the federal policy, found in Art. I, § 8, cl. 8 of the Constitution and in the implementing federal statutes, of allowing free access to copy whatever the federal and copyright laws leave in the public domain.<sup>156</sup>

Some courts regarded this pronouncement as having overruled, sub silentio, *Associated Press v. International News Service* and the entire misappropriation doctrine.<sup>157</sup>

The Supreme Court reexamined the field in *Goldstein v. California*.<sup>158</sup> Although the Court stated that it was reaffirming *Sears and Compco*,<sup>159</sup> its analysis and result were quite different. At issue was a California criminal statute making it a misdemeanor to make unauthorized duplications of sound recordings. Such record piracy had become a fertile field for the misappropriation doctrine. The Court upheld the validity of the statute, specifically holding that the Copyright Clause did not preempt a state copyright law. "[W]e cannot discern such an unyielding national interest as to require an inference that state power to grant copyrights has been relinquished to exclusive federal control."<sup>160</sup>

A year later, the *Goldstein* analysis was extended to possible federal statutory preemption of state trade secret law in *Kewanee Oil Co. v. Bicron Corp.*<sup>161</sup> Bicron was formed by former employees of Kewanee. Bicron was using Kewanee's technique for growing giant crystals, which were protected under state law as a trade secret. The Supreme Court held that federal patent law did not preempt state trade secret law.

The Court first stated the three objectives of patent law.<sup>162</sup> The first is to "promote the progress of science and useful arts,"<sup>163</sup> that is, to encourage invention. The second is to insure adequate disclosure of new inventions to allow their use by the public after expiration of the patent.<sup>164</sup> The third "policy" of the patent laws, which the Court admittedly originated, is that ideas in the public domain should remain there. "[F]ederal law requires that all ideas in general circulation be dedicated to the common good unless they are protected by a valid patent."<sup>165</sup> The exact reach of this "policy" was left unclear.<sup>166</sup>

The Court then discussed three categories of trade secrets separately: (1) those which do not meet the standards for patentability; (2) those which may

156. *Compco*, 376 U.S. at 237.

157. See, e.g., *DeCosta v. Columbia Broadcasting System, Inc.*, 377 F.2d 315 (1st Cir. 1967).

158. 412 U.S. 546 (1973).

159. *Id.* at 571.

160. *Id.* at 558.

161. 416 U.S. 470 (1974).

162. *Id.* at 479-82.

163. U.S. Const. art. I, § 8, cl. 8.

164. See 416 U.S. at 481, 35 U.S.C. §§ 111-112 (1984).

165. 416 U.S. at 481 (quoting *Lear, Inc. v. Adkins*, 395 U.S. 653, 668 (1969)). This statement was clearly dicta in *Kewanee*, as trade secrets are not, by definition, in general circulation. *Id.* at 484.

166. See *id.* at 484 n.13.

meet the standards; and (3) those which the inventor believes to be patentable.<sup>167</sup> For items in the first category, trade secret protection presents no conflict with the federal patent law; protection of these items is consistent with the patent policy encouraging invention.<sup>168</sup>

The second category involves items which may meet the standards of patentability. The Court found that inventors of items in this category would likely seek patent protection because such protection is far superior to the protection afforded by trade secret laws.<sup>169</sup> Furthermore, providing a state law alternative to federal protection would discourage inventors from wastefully applying for patents on items that are unlikely to qualify for patent protection.

The third category of inventions, those which are believed by the inventor to be patentable, presents the most serious issue.<sup>170</sup> Regarding this category, the Court stated: "If a State, through a system of protection, were to cause a substantial risk that holders of patentable inventions would not seek patents, but rather would rely on the state protection, we would be compelled to hold that such a system could not constitutionally continue to exist."<sup>171</sup> Because of the superior remedies available under the patent law, the Court held this risk to be "remote indeed" as to the protection of trade secrets.<sup>172</sup>

The same analysis applies to the misappropriation doctrine as defined here. For items that do not meet the standards for patentability, the misappropriation doctrine merely supplements and is fully consistent with the patent policy encouraging invention. For innovations of probable or uncertain patentability, inventors are likely to resort in most instances to the patent laws for protection because of the lack of any protection against independent derivation under the misappropriation doctrine and the superiority of patent remedies.<sup>173</sup> The federal patent policy favoring disclosure provides an additional reason for upholding a misappropriation cause of action. Allowing the states to protect trade secrets, while precluding any restriction on the appropriation of disclosed inventions, affirmatively encourages secrecy and discourages disclosure of product developments. As a result, such new developments would be unavailable for related but noncompetitive uses. Thus, under the analysis of *Goldstein* and *Kewanee*, neither the Constitution nor the policies underlying the patent laws appears to prevent a state from applying the misappropriation doctrine as discussed here.<sup>174</sup>

Section 301 of the Copyright Act<sup>175</sup> raises the question of express statutory preemption. Section 301 provides that the Act does not limit rights or

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167. *Id.* at 484.

168. *Id.* at 485.

169. *Id.* at 488-89.

170. *Id.* at 489.

171. *Id.* at 489.

172. *Id.* at 490.

173. See 35 U.S.C. §§ 281-294 (1984).

174. The Third Circuit reached this conclusion in *United States Golf Ass'n v. St. Andrews Systems, Data-Max, Inc.*, 749 F.2d at 1036 n.14; see also *Interpart Corp. v. Italia*, 777 F.2d 678 (Fed. Cir. 1985), in which the court, applying *Kewanee* and *Sears*, upheld a California statute that prohibits copying of manufactured items by a direct molding process.

175. 17 U.S.C. §§ 101-810 (1982).

remedies under state law except where (1) the subject matter protected is within the scope of federal copyright protection, and (2) the rights provided by the state law are equivalent to the rights provided by Section 106 of the Act.

The legislative history of the Act does not clearly indicate whether Congress intended Section 301 to preempt misappropriation.<sup>176</sup> Early versions of Section 301 in the bill that later became the new Copyright Act preempted misappropriation,<sup>177</sup> and later versions expressly refrained from preempting misappropriation laws not equivalent to federal copyright law.<sup>178</sup> The statutory language clearly exempting misappropriation from the scope of Section 301 was then deleted. Two diametrically opposed explanations were given for the deletion.<sup>179</sup> However, a more recent statement of Congressional opinion on the issue may provide guidance. The Report of the House of Representatives' Committee on the Judiciary concerning the 1980 legislation amending the Copyright Act states:

The Committee consulted the Copyright Office for its opinion as to whether Section 301 of the 1976 Copyright Act in any way preempted these and other forms of state law protection for computer software. On the basis of this advice and advice of its own counsel the Committee concluded that state remedies for protection of computer software are not limited by this bill.<sup>180</sup>

Putting aside the legislative history, application of the two-part statutory test to misappropriation is fairly straightforward. Initially, the intellectual property protected by the doctrine will frequently fall outside the subject matter of federal copyright protection, as defined in Sections 102 and 103 of the Copyright Act. Aside from computer programming, few innovations subject to the misappropriation doctrine would be literary, musical, dramatic, choreographic, or pictorial works or sound recordings. For innovations within the subject matter of copyright, misappropriation would be preempted only if the rights it provides are equivalent to the rights provided by the Copyright Act. In construing this second part of the test, some Courts have compared the elements of state misappropriation actions to the elements of federal copyright infringement actions: where the state claim requires an element not found in the federal copyright claim, the state claim is not preempted.<sup>181</sup> Misappropriation requires that the imitation be used in competition with the original.<sup>182</sup> A *prima facie* copyright infringement claim does not include the element of use in competition

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176. The legislative history is examined in depth in Abrams, *supra* note 66, at 537-45.

177. H.R. REP. No. 2237, 89th Cong., 2d Sess. 16 (1966); S. REP. No. 983, 93rd Cong., 2d Sess. 167 (1974).

178. S. REP. No. 473, 94th Cong., 1st Sess. 20 (1975); H.R. REP. No. 1476, 94th Cong., 2d Sess. 132 (1976).

179. Compare 122 CONG. REC. 32105 (1976), with Letter from Assistant Attorney General Thomas Kauper to Senator Hugh Scott, 122 CONG. REC. 3836-37 (1976).

180. H.R. REP. No. 1307, 96th Cong., 2d Sess., Pt. 1, at 23-24 (1980), reprinted in 1980 U.S. CODE CONG. & ADMIN. NEWS 6460, 6482.

181. See, e.g., *Suid v. Newsweek Magazine*, 503 F. Supp. 146, 149 (D.D.C. 1980); *John H. Harland Co. v. Clarke Checks, Inc.*, 207 U.S.P.Q. (BNA) 664, 668 (N.D. Ga. 1980); *George P. Ballas Buick-GMC, Inc. v. Taylor Buick, Inc.*, 5 Ohio Misc. 2d 16, 17, 449 N.E.2d 805, 807 (C.P. Lucas County 1981), *aff'd*, 5 Ohio App. 3d 71, 449 N.E.2d 503 (1982).

182. See *supra* Part IV(C) (discussion of elements of tort of misappropriation).

with the owner of the copyrighted work.<sup>183</sup> Because the elements differ, Section 301 should not be held to preempt misappropriation. Two federal circuit courts that have addressed the issue have reached this conclusion.<sup>184</sup>

## VI. ILLUSTRATIVE CASES

Free riding is a recurring problem for inventors and investors in innovation, and it is a pervasive issue for the attorneys who counsel them. Many of the illustrations and examples in this article were drawn directly from the author's experience. The misappropriation doctrine as advocated here is a workable solution to this real problem.

This section illustrates the problem and the solution, using reported cases. Three cases have been selected, one each from the areas of patent, copyright, and trade secrets. They are selected because the opinions set forth the facts with sufficient clarity and detail to allow them to be analyzed in terms of the misappropriation doctrine, not because of any intrinsic importance of either the disputes or the outcomes.

### A. Patent

As discussed in Part II(A) above, the patent system leaves "obvious" inventions unprotected. *University of Illinois Foundation v. Winegard Co.*<sup>185</sup> is a good illustration.

The invention at issue was a frequency-independent unidirectional antenna. The antenna achieves a high quality of unidirectional transmission or reception over a wide bandwidth of frequencies. It is especially useful for color television transmissions. The plaintiff had achieved this result with a logarithmically periodic dipole array. Although logarithmically periodic antenna designs were well known, both parties and the recognized authorities acknowledged that no one had previously achieved a design for frequency-independent operation.<sup>186</sup> This design avoided "severe end-effects" and unstable performance, both of which were undesirable operating characteristics from which some previous designs had apparently suffered.<sup>187</sup>

Unfortunately for the plaintiff, this desirable and unpredictable design achievement was the result of a logical and straightforward experimental program: "Where logical exploration within known principles of the science achieves an unpredictable result, even though a commercially desirable one, the burden of nonobviousness is not necessarily overcome."<sup>188</sup> The court found

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183. Any violation of the exclusive rights set forth in 17 U.S.C. § 106, which include the rights to reproduce or to prepare derivative works from the copyright work, constitutes an infringement. 17 U.S.C. § 501 (1982). Of course, use in competition might affect the amount of damages recoverable pursuant to 17 U.S.C. § 504 (1982).

184. *United States Trotting Ass'n v. Chicago Downs Ass'n*, 665 F.2d 781, 785 n.6 (7th Cir. 1981); see also *Roy Export Co. v. Columbia Broadcasting Sys.*, 672 F.2d 1095, 1106 n. 19 (2d Cir. 1982).

185. 402 F.2d 125 (8th Cir. 1968), cert. denied, 394 U.S. 917 (1969).

186. *Id.* at 126.

187. *Id.*

188. *Id.* at 127.

that the invention was obvious to one skilled in the art and therefore was not entitled to patent protection.

The obviousness issue in *University of Illinois* could have been decided either way. Indeed, one district court had found the patent valid, while another had found it to be invalid for obviousness.<sup>189</sup> For current purposes, the point is that the court's decision conveyed the inventor's experimental industry in developing this new and useful design to plaintiff's competitors and to the public, thereby possibly undermining the incentive to undertake such efforts in the future.

The result would be different under a misappropriation analysis. The court's opinion suggests a substantial investment of time and opportunity cost by the innovator. The opinion does not indicate whether the defendant appropriated the design from plaintiff or derived it independently.<sup>190</sup> If defendant used plaintiff's innovation or products to produce its competing product line, all of the elements of misappropriation would be satisfied.<sup>191</sup> On the other hand, if the defendant independently developed the antenna from the same information available to the plaintiff, no cause of action would lie.

## B. Copyright

The issue of copyright protection for technological innovations arises most often in connection with computer software. *Synercom Technology, Inc. v. University Computing Co.*<sup>192</sup> is illustrative.

Plaintiff Synercom developed a computer program to perform static structural analysis. The basic solution algorithms were well known and in the public domain. Synercom simplified and sped up both the input and output and expanded the analytical capacity of the program compared to alternative programs.<sup>193</sup> Synercom invested approximately \$500,000 and many years of effort in these innovations.<sup>194</sup> The resulting product began to enjoy considerable success in the marketplace. Synercom completed all formalities necessary for copyright protection.

The principal defendant, Engineering Dynamics, marketed another apparently inferior structural analysis program. Former marketing representatives of Synercom formed a joint venture with Engineering Dynamics to compete with Synercom. The strategy was straightforward: appropriate the significant elements of Synercom's program, then underprice it. As the court described it: "Without the cost of developing the input formats or of training customers in their usage, [Engineering Dynamics] was in position to simply pluck the fruit of

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189. *Id.* at 126.

190. That issue does not need to be resolved in a patent infringement action, because patents protect against independent derivation as well as against appropriation.

191. The court's silence on the point suggests that plaintiff may have appropriated the defendant's designs; independent derivation by the defendant would have buttressed the court's conclusion that the invention was obvious to one skilled in the art.

192. 462 F. Supp. 1003 (N.D. Tex. 1978).

193. *Id.* at 1007.

194. *Id.* at 1008.

Synercom's labors and risks, if [Engineering Dynamics' program] was as good or better than [Synercom's]."<sup>195</sup> Engineering Dynamics quickly introduced its competing product. Its formats, arrangements, and sequencing were substantially identical to Synercom's product.<sup>196</sup>

Synercom sued for copyright infringement. The evidence established, and Engineering Dynamics ultimately conceded, that it had deliberately duplicated Synercom's data structures.<sup>197</sup> The court nevertheless denied relief, reasoning that the sequencing and ordering of the data was an idea, not protectable expression.

The *Synercom* court's interpretation of the idea/expression dichotomy was not irrational, although other courts have adopted a broader view of the scope of copyright protection.<sup>198</sup> However, the disincentives created for efficient innovation are obvious. Why should a company expend \$500,000 to develop and improve a useful product if a competitor can appropriate the results without substantial cost?

A misappropriation cause of action eliminates these disincentives. Synercom made a substantial investment in innovation, which Engineering Dynamics then appropriated and used in competition with Synercom. Even if the court did not find copyright infringement, Synercom would retain a cause of action (albeit without the generous statutory remedies)<sup>199</sup> for misappropriating the idea.<sup>200</sup> Alternative causes of action for copyright infringement and misappropriation would thus complement each other to discourage free riding and maintain proper incentives for innovation.

### C. Trade Secrets

The illustrative trade secret case is *Electro-Craft Corp. v. Controlled Motion, Inc.*<sup>201</sup> Electro-Craft manufactured electric servo motors for high technology applications. These motors are complex and ingenious and have the capability of starting and stopping at least thirty times per second. Electro-Craft developed several successful motors for different applications after several years of trial

195. *Id.*

196. In addition, Engineering Dynamics' manuals were largely verbatim copies of Synercom's manuals. Synercom was granted relief for copyright infringement of its manuals. *Id.* at 1014-15.

197. *Id.* at 1012.

198. *E.g.*, *Whelan Associates, Inc. v. Jaslow Dental Laboratory, Inc.*, 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 55 U.S.L.W. 3473, No. 86-675 (Jan. 12, 1987) (copyright protection of structure and ordering of computer program); *accord Broderbund Software, Inc. v. Unison World, Inc.*, 648 F. Supp. 112 (N.D. Cal. 1987); *but see Plains Cotton Coop. Ass'n v. Goodpasture Computer Serv., Inc.*, 807 F.2d 1256 (5th Cir. 1987). *See generally* Comment, *supra* note 61, at 419-30.

199. Remedies for copyright infringement include injunction, 17 U.S.C. § 502 (1982); actual damages, 17 U.S.C. § 504(b) (1982), or statutory, 17 U.S.C. § 504(c) (1982); criminal prosecution, 17 U.S.C. § 506 (1982); impounding of infringing articles, 17 U.S.C. § 503(1982); and costs and attorneys' fees, 17 U.S.C. § 505(1982).

200. In a later opinion, the court essentially determined that Engineering Dynamics' actions constituted misappropriation, but found that the misappropriation doctrine was preempted by federal law. *Synercom Technology, Inc. v. University Computing Co.*, 474 F. Supp. 37 (N.D. Tex. 1979).

201. 332 N.W.2d 890 (Minn. 1983). The following discussion will omit separate citations in support of each of the facts recited, all of which are clearly and succinctly set forth in the court's opinion.

and error, at a cost in excess of two million dollars. The national sales manager for Electro-Craft then quit and formed Controlled Motion. He immediately hired four technical employees from Electro-Craft. Approximately three months later, Controlled Motion delivered a prototype servo motor to Storage Technology, a major customer of Electro-Craft. The prototype was essentially identical in design, technology, and fabrication to one of Electro-Craft's motors. The trial court found that Controlled Motion had taken Electro-Craft's trade secrets and entered an injunction against Controlled Motion.

The Minnesota Supreme Court reversed and vacated the injunction on the ground that Electro-Craft had failed to make reasonable efforts to maintain the secrecy of its designs and technology. Some of the entrances to the factory were unlocked and unguarded. Plans and designs were simply discarded, not shredded. Employees did not wear security badges. Technical documents were not stamped "confidential," and not all technical and design information was kept in a central and locked location.<sup>202</sup>

This decision may be sustained under the law of trade secrets. As a matter of public policy, it is perverse. The incentives it creates are detrimental to the advancement of high technology and to the efficient functioning of the economy.

First, the decision induces Electro-Craft and others in its position to implement much stricter security precautions. These confer no conceivable economic or social benefit. The burden may seem insignificant, but it may not be so. Guards at every entrance and exit are a non-trivial and unproductive expenditure. Engineers cannot refer to preliminary design documents later if they have been shredded, nor can they design while they are retrieving their notebooks from or returning their notebooks to central locked storage. This kind of grit may not stop, but it certainly slows, the gears of technical progress.

Second, the court's decision undermines the incentive to invest in this kind of innovation. No secrecy is perfect; hindsight will always suggest tighter (and more costly) security efforts that might have been reasonable and appropriate. Electro-Craft is a paradigm because the appropriation was so blatant. A more cautious imitator might have made some pretense of engaging in "reverse engineering" (that is, appropriating the design by careful inspection rather than by theft), thereby injecting another issue into the case. With such uncertainty, a decision simply not to invest heavily in such innovation would be quite rational.

The economic and social costs of such a decision are obvious based on the facts of *Electro-Craft*. At the time of the suit, Electro-Craft had captured more than half of the domestic market for an advanced kind of servo motor with its innovative design.<sup>203</sup> Storage Technology and IBM were purchasing many of

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202. None of these lapses in security caused Electro-Craft's problem. Controlled Motion did not appropriate Electro-Craft's designs by sneaking in unguarded entrances, or finding discarded plans, or stealing unsecured notebooks. The founder of Controlled Motion, on his departure from Electro-Craft, had told Electro-Craft's president "not to worry" about trade secrets. *Id.* at 895. He then proceeded to extract the desired information in the most direct and efficient manner, from Electro-Craft's technical employees.

203. *Id.* at 894.

the devices. The market was projected to grow from approximately two million dollars to more than fifty million dollars within five years.<sup>204</sup> Even the court's cursory discussion of the technology involved establishes that advances would not occur without substantial investments, which Electro-Craft would undertake only in the expectation of future profit. But neither the word "incentive" nor any synonym thereof appears in the court's opinion.<sup>205</sup>

The result under a misappropriation analysis would have been different. Electro-Craft made a substantial investment in the development of its motors. Controlled Motion appropriated the technology. Controlled Motion then used the appropriated technology to compete with Electro-Craft. The injunction in favor of Electro-Craft would have been upheld. Controlled Motion could either license the technology from Electro-Craft or hire its own engineers and design its own motors. In either event, Electro-Craft could continue its development efforts without hiring unnecessary guards or placing counterproductive constraints on its engineers, knowing that it would enjoy the profits from any successful innovations.

## VII. CONCLUSION

The legal system fails to protect a variety of high technology innovations from unrestricted imitation. This failure leads to pressures to expand traditional forms of protection beyond previous bounds and to enact new, industry-specific protections, such as the Semiconductor Chip Protection Act,<sup>206</sup> to remedy the most glaring problems in the most politically visible technologies. These *ad hoc* approaches are deficient.

The common law offers a better solution. The misappropriation doctrine, applied consistently in accordance with its economic rationale, provides the minimal protection necessary to discourage free riding and to maintain appropriate incentives for investment in innovation. Wider recognition and application of the doctrine would improve efficiency and competitiveness in many fields of technology.

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204. *Id.*

205. This fact is not intended to reflect adversely on the court's opinion; no discussion of incentives is required under the court's trade secret analysis.

206. 17 U.S.C. §§ 901-14 (1982).

