ECONOMIC INCENTIVES IN MARKETS FOR INFORMATION AND INNOVATION

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> And when we turn to such problems of . . . inventions or of literary or artistic creations, nothing short of going back to [the] rationale of property will help us decide what should be in the particular instance the sphere of control or responsibility of the individual.
>
> — Hayek[1]

> [I]n the current state of knowledge, economists know almost nothing about the effect on social welfare of the patent system or of other systems of intellectual property.
>
> — Priest[2]

I. INTRODUCTION

Scholars generally think of intellectual property rights, as incentives to produce and trade innovative ideas. Current wisdom, embodied for instance in the *Encyclopaedia Britannica*, ranks them among property rights in general, as indeed their title suggests. The idea of ranking intellectual rights as property goes back to the French Revolution. In replacing a system of privileges granted in the discretion of the authorities with non-discretionary rights to exploit inventions or literary creations, the proponents of the new legislation of the time insisted that:

> of all forms of property, the least susceptible of being contested is without question that of the works of a man of talent or genius; something must astound us: it is that an Act has been necessary to recognize this property and to ensure

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1. Hayek, *Individualism: True and False*, in INDIVIDUALISM AND ECONOMIC ORDER 21 (H. Cy ed. 1972).

2. Priest, *What Economists can Tell Lawyers about Intellectual Property*, in 8 RESEARCH IN LAW AND ECONOMICS: THE ECONOMICS OF PATENTS AND COPYRIGHTS 21 (J. Palmer ed. 1986).

its exercise.[3]

The view of intellectual rights as property rights did not survive long even in France, since, as Roubier[4] notes, in the Act of 5 July 1844 on patent and the Act of 14 July 1866 on copyright, the legislature systematically refrained from using the term property. This perhaps reflects the doubts that economists were voicing about the nature of the intellectual rights, some considering these rights as mere state-granted monopolies.[5] In the Twentieth Century, however, legislation concerning patent, copyright, trademark and industrial design has been expanded continually. International treaties have stretched the reach of these rights across national boundaries.

Recent advances in reprography and computer technology have once more brought the issue of the theoretical status of intellectual rights into question. These advances greatly facilitate and reduce the cost of copying information from one medium to another. Information has become less dependent on the vehicle through which it is conveyed; it has become "purer."[6]

The enforcement of intellectual rights has become correspondingly more difficult. The legal system has responded with new methods of enforcement. An example of these new enforcement methods is the judicially created Anton-Piller order,[7] allowing a copyright holder, upon an ex parte hearing, to search the defendant's premises for offending material and to seize it. The remedy has been granted regularly in the realm of software piracy, although only in exceptional circumstances and against "commercial" pirates. The remedy makes one realize that to enforce literally the prohibition of copying music onto cassettes, films onto video tapes, and computer programs onto diskettes, it may be necessary to intrude into people's privacy in frightening ways. Inasmuch as they invite such aberra-

3. "de toutes les propriétés, la moins susceptible de contestation, c'est sans contredit celle des productions du génie; et quelque chose doit étonner, c'est qu'il eut fallu reconnaître cette propriété, assurer son exercice par une loi positive." C. COLOMBET, PROPRIÉTÉ LITTÉRAIRE ET ARTISTIQUE ET DROITS VOISINS 7 (3d ed. 1986) (quoting Lakanal's report in preparation for an Act of 19 July 1793).

4. *See* P. ROUBIER, LE DROIT DE LA PROPRIÉTÉ INDUSTRIELLE 69 (1952).

5. *See id.* at 70.

6. *See* Adelstein & Peretz, *The Competition of Technologies in Markets for Ideas: Copyright and Fair Use in Evolutionary Perspective*, 5 INT'L REV. L. ECON. 209, 217 (1985).

7. First recognized in Anton Piller K.G. v. Manufacturing Processes Ltd., 1 All E. R. 779 (C.A. 1976).

tion, intellectual rights would seem to be incompatible with property and other fundamental rights.

The question has been raised of whether the apparent incompatibility does not stem from a fundamental flaw in the very concept of intellectual property rights. The case for such a position has recently been stated most explicitly by Tom Palmer[8] in the United States and with equal conviction but in less detail by Henri Lepage[9] in France. This Article is written as part of the debate stirred up by Palmer's and Lepage's articles.

It seems worthwhile to sum up in a few propositions what I take to be Palmer's position.

1. *Patent and copyright are not the product of an evolutionary process.* Patent and copyright are not the result of an evolutionary process and require massive amounts of state intervention for their sustenance.[10] Trademark and trade secrecy laws by contrast are legitimate products of such a process and have a different foundation.

2. *Patent and copyright have grown out of illegitimate privileges.* Patent and copyright have grown out of privileges (monopolies) granted to manufacturers and printers rather than to inventors and authors. (The alleged unsavory origin of an institution does not, however, of itself entail its condemnation.)

3. *Patent and copyright are not species of property rights.* "Patent and copyrights are forms, not of legitimate property rights, but of illegitimate state-granted monopolies."[11]

4. *Rights cannot be created at will by the authorities.* "Rights are not creations of the state, bestowed as gifts upon the people by wise and beneficent legislators, but simultaneously the spontaneous product and the ground . . . of the system of voluntary interactions we call the market."[12] This thesis is further articulated in a footnote quotation: "It is one thing to articulate an ex post property right interpretation of the mining district, the oil lease; . . . it is quite another to design ex ante property right institutions that will operate in the way we claim these 'natural

8. Palmer, *Intellectual Property: A Non-Posnerian Law and Economics Approach*, 12 HAMLINE L. REV. 261 (1989).

9. H. LEPAGE, LA NOUVELLE ÉCONOMIE INDUSTRIELLE 349-84 (1988).

10. Palmer, *supra* note 8, at 264-65.

11. *Id.* at 264-68.

12. *Id.* at 280.

experiments' have operated."[13]

5. *Patent and copyright must not be justified by appealing to (static) efficiency.* Patent and copyright must not be justified by appealing to (static) efficiency, as is proposed by Richard Posner.[14] This reflects a constructivist or interventionist bias. The law is concerned with attributing rights rather than with the promotion of some social policy judged to be desirable. This criticism extends to Bentham and perhaps to all forms of utilitarianism.

6. *Our thinking faculties cannot be the object of exclusive rights.* "[T]he right of a free exercise of our thinking faculties is given by nature to all mankind . . . . [T]he mere fact that a given mode of doing a thing has been thought of by one, does not prevent the same ideas presenting themselves to the mind of another and should not prevent him from acting upon them."[15]

7. *Spurs to innovation are present in the market, without state intervention.* "Regimes that foster innovation and creativity can and do emerge through the market process without legislative or judicial intervention."[16]

8. *The alleged "public good" character of information does not justify state intervention.* The "public good" character of information, frequently invoked as reason for state intervention creating patent and copyright, is not an immutable fact of nature, but a drawback contingent upon the techniques available for curtailing free riding. It is a cost of producing information as it is a cost of property rights in physical commodities. Market forces, left to themselves, will seek to adopt innovations driving this cost down.[17]

This Article is divided into four Parts: Part I is this introduction; Part II examines incentives in general; Part III examines incentives to produce information; and Part IV contains the general conclusion. Part II examines the nature of property rights, which are the main avenue for creating incentives in civil society. Only when they are thought not to work are alternative schemes based on government intervention put in place. We must therefore examine when such alleged "market failure" oc-

13. *Id.* at 281 (quoting V. Smith, *Comment*, in PROGRESS IN NATURAL RESOURCE ECONOMICS (A. Scott ed. 1985)).

14. R. POSNER, ECONOMIC ANALYSIS OF LAW (1986).

15. Palmer, *supra* note 8, at 281 (quoting W. LEGGET, DEMOCRATICK EDITORIALS: ESSAYS IN JACKSONIAN POLITICAL ECONOMY 399 (1984).

16. *Id.* at 287.

17. *Id.* at 273.

curs. Finally, because property rights are recognized in the legal system, we examine how such recognition comes about.

Part III deals with incentives for producing information. Here we first examine the nature of information and its relationship with sources of alleged "market failure." The second section deals with the law relating to information, in particular the rules, besides patent and copyright, which relate to novel ideas. This allows us to look, in the third section, at the core issue of the status of patent and copyright.

II. Incentives in General

A. *Broad Avenues*

Innovative ideas sprout in the minds of innovative individuals; they are worked out in their machine shops and laboratories, or on their drawing boards and writing desks; they are implemented in productive processes.[18] The peculiar characteristic of innovative ideas is that one cannot know, in advance, whether any will be forthcoming, nor whether those that are will be successful. Innovation expresses the openness of our society to the future.[19] Innovation involves gambling, betting on ideas.[20]

What drives people to become innovators? Brenner argues that this tendency will be most prevalent among individuals who have been subjected unexpectedly to a dramatic loss in status or where the status quo crumbles and unanticipated expectations of upward social mobility are awakened. Betting on new ideas is a means of trying to recover lost ground. These new ideas may be innovations in the usual sense; they may also be criminal activity.

If this explanation is correct, innovation is spurred on by

18. It is important to add this last qualification since novel ideas do not automatically find their way into general usage. For example, Baechler notes that the wind mill and the harness for draught animals were probably discovered in the Fifth Century B.C. but not widely used until the Eleventh or Twelfth Century in North-Western Europe. *See* J. Baechler, The Origins of Capitalism (1975).

19. Kirzner explains, "We may argue, with great confidence, that under capitalism entrepreneurial discovery will disclose new arrays of opportunities—but precisely because these are wholly new opportunities created by entrepreneurial discovery, they cannot be seen in any sense as the inevitable outcome of the entrepreneurial process." I. Kirzner, Discovery and The Capitalist Process 163 (1985).

20. R. Brenner, Betting on Ideas: Wars, Invention, Inflation (1985); *see also* F.M. Scherer, Industrial Market Structure and Economic Performance 389 (1970) (arguing that innovation is a lottery, with the high prizes being what counts).

people's fears, unhappiness, and hopes.[21] This view presupposes that, in the eyes of the innovators, very large rewards may be gained from it.[22] These rewards must pay for the facilities used. More importantly, they must, in Kirzner's words, "offer gain to the potential discoverer himself."[23] Kirzner explains: "The kind of incentive . . . is that required to reveal opportunities that have until now been perceived by no one at all."[24] While the availability of such rewards does not of itself ensure substantial innovation,[25] it clearly is a necessary condition.

How are these rewards made available? Several broad avenues are open to create rewards for innovation. Innovators may be hired or given prestigious positions on a temporary or permanent basis. They may be given stipends or research grants. They may be rewarded for individual works by prizes or other honors or be commissioned for specific works. They may rely on voluntary contributions of those who have attended a performance. Artisans may sell individual copies of their handwork. Or a prince may grant, initially in his discretion but later as a *grace fondée en justice*,[26] the exclusive privilege to sell particular innovations. All of these devices and others have been used to reward creative activity.

Over time, the reward structure that will prove most satisfactory to beneficiaries and patrons alike is one that satisfies the proportionality criterion formulated by Hayek, in which

> the relative remunerations the individual can expect from the different uses of his abilities and resources correspond to

21. R. BRENNER, *supra* note 20, at 76.

22. Though the prospect of reward or of avoiding displeasures is not generally the only incentive to action, it has become the dominant one. People donate blood anonymously; they vote; they undertake what appear to be altruistic actions; and judges render decisions in accordance with law. Commentators disagree as to whether such actions can be accounted for within the economist's logic of choice (of pains and pleasures). For a discussion of "alternative" economies, see K. BOULDING, THE ECONOMY OF LOVE AND FEAR (1973); D. COLLARD, ALTRUISM & ECONOMY: A STUDY IN NONSELFISH ECONOMICS (1978); H. MARGOLIS, SELFISHNESS, ALTRUISM, AND RATIONALITY: A THEORY OF SOCIAL CHOICE (1982); S.C. KOLM, LA BONNE ÉCONOMIE: LA RÉCIPROCITÉ GÉNÉRALE (1984); D. NORTH, STRUCTURE AND CHANGES IN ECONOMIC HISTORY (1981).

23. I. KIRZNER, *supra* note 19, at 29.

24. *Id.* at 29 (emphasis in original); *see also id.* at 167 (arguing that entrepreneurial activity is not limited to capitalism, but requires everywhere "the prospect of winning entrepreneurial gain").

25. Money does not buy novelty and may, in the appropriate circumstances, lead to rent-seeking.

26. *See* P. ROUBIER, *supra* note 4, at 21; *see also* D. NORTH & R. THOMAS, THE RISE OF THE WESTERN WORLD—A NEW ECONOMIC HISTORY 126 (1973).

> the relative utility of the results of his efforts to others [and in which] these remunerations correspond to the objective results of his efforts rather than to their subjective merits.[27]

What would such a structure look like? It would be based on private property rights. We must now examine this institution.

B. *Property Rights*

In a broad sense, economists use the term property rights to describe an approach to how the rights to decide on the use of resources are distributed.[28] Property rights "[describe] the individual and group incentives in the system."[29]

1. *Scarcity*

Property rights are a response to scarcity. Scarcity manifests itself where people envisage different uses of a resource that are incompatible. It imposes a choice among these alternative uses. The film *The Gods Must Be Crazy*[30] colorfully illustrates the concept of scarcity and its opposite, abundance. The film shows a bushmen tribe living in the Kalahari desert. Ancestral customs make it possible for the tribespeople to live comfortably with what they find in their natural surroundings. The members of the tribe see this as abundance provided by the gods. One day a small commercial airplane overflies the tribe's territory and the pilot tosses out an empty Coke bottle. This gift from the gods is received with curiosity. The children who find it discover games they can play with it. Their mothers discover ways in which the strange object is useful for various household tasks. Soon conflict develops over who may use the object and for how long. Conflict of this kind is unknown to the tribespeople. At a gathering, they decide that the gods must be angry with them to send such an object of discord and that the best course is to return it to the gods. This mission is conferred upon one of the elders, who becomes embroiled in many adventures trying to accomplish it.

The story illustrates the concept of scarcity. To the tribespe-

27. *See* F. HAYEK, INDIVIDUALISM: TRUE AND FALSE 21 (1948).

28. *See* A. ALCHIAN, ECONOMIC FORCES AT WORK 127-49 (1977); Demsetz, *Towards a Theory of Property Rights*, 57 AM. ECON. REV. 347 (1967). *See generally* THE ECONOMICS OF PROPERTY RIGHTS (E. Furubotn & S. Pejovich ed. 1974); A. SCHÜLLER, ÖKONOMIK DER EIGENUMSRECHTE IN ORDNUNGSTHEORETISCHER SICHT 155 (1988).

29. D. NORTH, *supra* note 22, at 7.

30. Jamie Uys, Director (1981).

ople everything is abundant. Within the mode of life of the tribe, as shaped by ancestral custom, members of the tribe can consume at will without exhausting what nature provides. Only the bottle is scarce: there is not enough of it, considering all the uses that various tribespeople envision for it. A choice must be made; a rule must be adopted for husbanding the scarce object. The tribespeople refuse this perspective and eliminate the source of the problem.

The story shows that scarcity is a subjective concept, relative to preferences and known uses. Scarcity imposes a choice among alternative uses, creating conflicts among those who advocate those alternatives. Conflict may be solved in many ways, some of them violent. One alternative is to award the right to decide to one party or to divide the resource and give each party such right on a part: exclusive rights or property rights. Demsetz has described such a solution for hunting grounds among Montagnais Indian tribes[31] and Umbeck describes a similar solution for mining claims during the Gold Rush.[32] Sugden's theoretical work purports to show that such solutions could emerge at the instigation of the parties themselves and could be stable.[33]

2. *The Structure of Property Rights*

Property rights may come into being as a solution to conflict. Yet they produce effects well beyond the conflict they may initially have been intended to resolve. The abstract features of property rights have been pictured in Diagrams 1 and 2 below.

a. *Inalienable Rights*

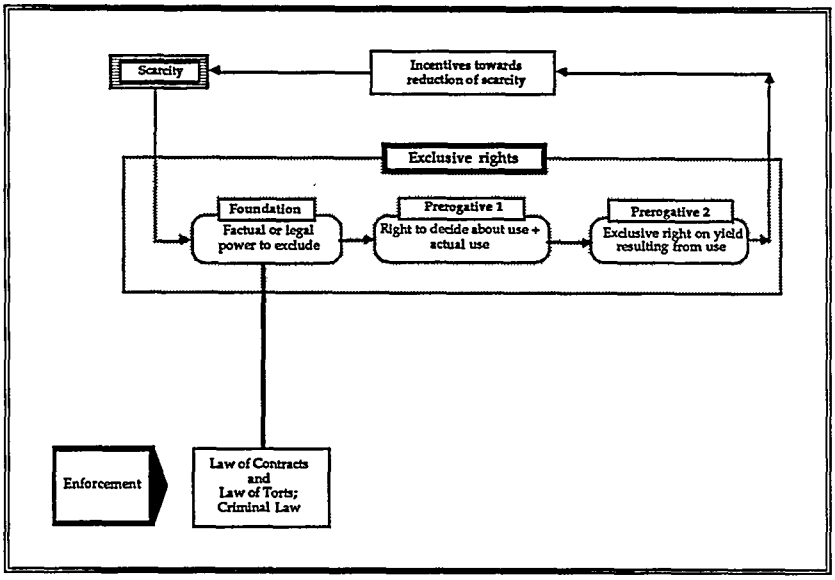
Diagram 1 shows that the exclusive right presupposes the possibility of excluding third parties from using the prerogatives which the right confers. There are two such prerogatives: the decision on how to use the resource (the object of the right) and the entitlement to the yield flowing from that decision.

31. Demsetz, *supra* note 28, at 347 (based on accounts by Eleanor Leacock). The historical accuracy of these facts has been contested. *See* McManus, *An Economic Analysis of Indian Behavior in the North American Fur Trade*, 32 J. ECON. HIST. 36 (1972).

32. *See* Umbeck, *Might Makes Right: A Theory of the Foundation and Initial Distribution of Property Rights*, 19 ECON. INQ. 38 (1981).

33. *See* R. SUGDEN, THE ECONOMICS OF RIGHTS, CO-OPERATION & WELFARE (1986) (explaining by means of game theory the conditions under which such a solution might develop and be stable).

DIAGRAM 1. EXCLUSIVE RIGHTS



The conjunction of these two prerogatives creates a powerful incentive effect: a direct link between how a resource is used and the resulting reward for the decision maker. Prudent use is rewarded and squandering is penalized without the need for a superior authority to establish these links. Exclusive rights meet the proportionality criterion stated in section II(A).

The value of a right to its owner depends on the size of the yield and on the cost of maintaining exclusivity. Obviously the higher the latter cost, the less likely it is that the right is of interest. Conversely, when new discoveries lower the cost of exclusivity, rights may become viable that were previously without interest. Where a person is capable of effectively creating exclusive control over some resource, he has the equivalent of an exclusive right, by whatever name his situation goes. Exclusivity is sufficient for simulating an exclusive right.

The incentive effect of an exclusive right or its equivalent, therefore, extends to finding means of exclusion which make the right more effective or even make it possible in the first place. Exclusivity can be secured by physical means. It can also be guaranteed to some extent by contractual provisions, as well as by the law of torts and criminal law, against persons with whom one has no contractual relationship.

Besides its "incentive" effect, the exclusive right has an "information" effect. By attaching prospective yields to different uses, the exclusive right makes it possible for the owner effectively to compare his options and to reach an informed decision about the best use to which the resource can be put.

An exclusive right is the basic form of a property right. Humans have such rights in their life and liberty.

b. *Alienable Rights*

Diagram 2 shows what happens when the exclusive right is made transferable. In general, this enhances the incentive and information effects described above. The diagram entails a number of enrichments, some of which are described below.

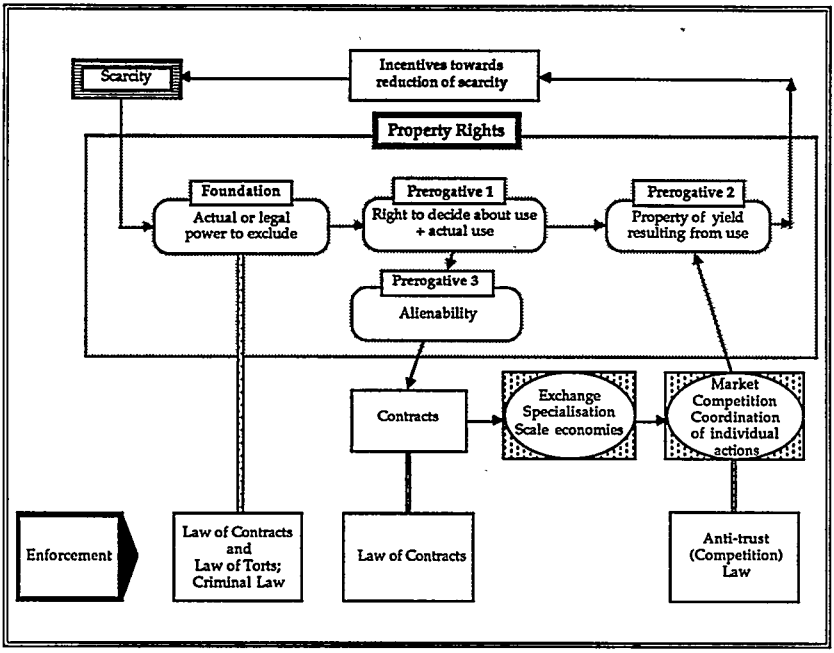
Transferability (alienability) is a condition for exchange, and, in a more developed form, trade. The possibility of exchange and trade, in turn, encourages specialization (division of labor) and economies of scale. This may create competition and markets. Prices in the market tend spontaneously to coordinate the diverse plans of individuals. Price discrepancies are continually being corrected by entrepreneurs who seize the opportunities for profit that result from such discrepancies.[34] Prices express the relative scarcity of goods available in the market. Transferability therefore enhances the information effect of property rights. The signals they provide relate not only to goods one owns oneself, but equally to those that others own.

Transferability of property rights also enhances the incentive effect. Not only does the owner prospect the uses to which the property can be put, but so do outsiders who might buy the property from the owner when they discover a more profitable use for it than the owner has chosen. Both the information and the incentive effects increase the extent to which property rights incorporate the proportionality criterion formulated in section II(A), that is, the rewards for the owner are in proportion to the usefulness of the product as it is perceived in the open class of purchasers.

Just as transferability increases the information and incentive effects of property, so it strengthens the derivative incentive of improving means of ensuring exclusivity. Because exclusivity is sufficient for creating the equivalent of an exclusive right, and

34. I. KIRZNER, *supra* note 19, at 30.

DIAGRAM 2. ALIENABLE EXCLUSIVE RIGHTS OR PROPERTY RIGHTS



since transfer can be governed by rules of contract, there exist among individuals, outside of formal recognition by law, the means to "experiment" with forms of property rights. Forms that turn out to be successful may subsequently be codified into law. Much of commercial law has been shaped in this manner from commercial practices.[35]

The presentation of property rights may have created the impression that a single attribute, the possibility of a single use, is conferred upon the holder. This is a simplification. Property rights are bundles of prerogatives. Indeed, one of the interesting features of a property right is the power to factor out particular attributes or specific uses of it, and transfer these to others. This makes it possible to combine features according to practical need and to discover in the process which combinations are most useful, and hence, which should be codified as specific limited rights or nominate contracts.[36]

35. F. HAYEK, 3 LAW, LEGISLATION AND LIBERTY: RULES AND ORDER 82 (1973).
36. T. SOWELL, KNOWLEDGE AND DECISIONS 124 (1980).

3. *The Diversity of Property Rights in Existing Legal Systems*

In the debate mentioned at the outset of this Article, a distinction is drawn between intellectual property rights and ordinary property rights in physical goods. Yet "ordinary" property rights are by no means a homogeneous class. Moreover, the impression was created that, in contrast to ordinary property rights, exclusivity for intellectual property rights would have to be guaranteed to an unacceptable degree by the state in its police function. It must be realized that, for ordinary rights as well, the law clearly recognizes a role for the owner in ensuring exclusivity. A few remarks illustrate these two points.

The diversity of property rights is evident in the distinction recognized in all legal systems between tangibles and intangibles. Tangibles are divided into two classes: movable and immovable, such as "chattels" and "real property" respectively. This leads to three broad classes of rights. There are many practical differences between the property rights defined over these three classes of goods. Let us examine some differences between movable and immovable goods. Similar distinctions could be shown between intangible and tangible goods.

First, the formalities for transfer vary considerably between movable goods and immovable goods. This is true if only because immovable goods are registered. Historically, transfer of immovable goods has not always been permitted.

Second, where a third party uses the good without opposition on the part of the owner, he may in due course acquire a full right to the property or a limited right to the property through "acquisitive prescription," or "adverse possession" in the common law. The period of time required for prescription varies considerably between movable goods and immovable goods.

Third, a difference manifests itself in cases where the owner loses control of the good. Where someone unlawfully intrudes upon an immovable property belonging to another, the owner normally has an action to eject the intruder and recover unencumbered enjoyment of the property. Sale of the immovable by a non-owner is unlikely because of the system of public registration. For movable goods, protection is not so complete. Where the owner has lost possession of a movable and it has been since sold to a third party, the owner cannot always re-

cover possession. In some instances, the third party is fully protected against the initial owner's action; in others he must surrender the good but can then insist on reimbursement of the price he paid.[37] The law balances the right of the initial owner against that of the new one, taking into account the manner in which the former has lost possession (for example, voluntarily or by theft) and the precautions the latter has taken in acquiring the good. Such distinctions are irrelevant for immovables.

A fourth difference is the elaborate system of rules concerning conflicts between neighboring properties defined for immovables but without application for movables.

This short overview shows that property rights vary in practical details corresponding to the distinct features of the classes of goods to which they extend. In the workings of actual legal systems, property rights for different classes of goods have a common core, but differ in detailed practical specifications. It is also obvious that the law takes into account the manner in which the owner maintains exclusivity for his property.

These variations among the property rights for different classes of goods are not merely imperfections to be ignored. They reflect constraints of the world as we know it. Although we may wish that these constraints were absent, to analyze the world as if they are would represent what Demsetz terms a Nirvana approach.[38] These constraints are no less real than transaction costs, which prevent seemingly profitable trades from being consummated. Dahlman has shown that transaction costs are precisely what explains the diversity of institutions around us.[39] The history of the law could be analyzed as a succession of initiatives designed to lower transaction costs in particular contexts. These costs provide precisely the incentives for individuals trying to improve their lot.

C. *The Vicissitudes of Exclusivity: "Market Failure," Externalities, Public Goods, and Free Riders*

It was argued above that where someone can ensure sufficient exclusivity over a resource at an acceptable cost (considering the yield), she has a de facto private property right.

37. *See, e.g.*, Code Civil art. 2279 and 2280 (Fr.); Code Civil art. 2268 (Québec).
38. *See* Demsetz, *Information and Efficiency: Another Viewpoint*, 12 J.L. & ECON. 1 (1969).
39. *See* Dahlman, *The Problem of Externality*, 22 J.L. & ECON. 141 (1979).

Where such exclusivity cannot be achieved, the right on the resource and its exploitation are not viable. The resource might then be said to be "unappropriable."

The cost of exclusivity is like a production cost. A product will be made only if there is the prospect of a profit after all production costs have been paid. This principle applies to exclusivity costs as it does to any other production costs. Products may become viable, or merely more profitable, as a result of advances in techniques for ensuring exclusivity. Increased yield for a product creates a market for innovation in techniques of exclusivity. Altogether, these arguments lead to the conclusion that exclusivity might be left to market forces.

1. *Market Failure in General*

This conclusion is at variance with the so-called "market failure" literature within the neo-classical tradition.[40] Market failure is said to occur where conditions of perfectly competitive markets are not met. It may take the form of public goods, externalities, monopolies, or transaction costs. In such cases, corrective government intervention is thought to be the appropriate remedy.

Public goods are said to have two characteristics which distinguish them from private goods: non-excludability and non-rivalry. Non-excludability means that once a good is available, it is difficult to exclude anyone from consuming it; non-rivalry means that one person's consumption does not reduce the quantity of the good available for consumption by others. Private goods are both rival and excludable. As an example of rival but non-excludable goods, Preston describes the situation of bee-keeping and flower-growing in a given area: no bee can be excluded from a particular flower, no flower from a particular bee. Yet, bees and flowers, in themselves, are rival.[41] Examples of non-rival, excludable goods are a theatre performance where the supply of seats exceeds the demand, and an uncon-

40. *See, e.g.*, Samuelson, *The Pure Theory of Public Expenditure*, 36 REV. ECON. STATS. 387-89 (1954); Bator, *The Anatomy of Market Failure*, 72 Q.J. ECON. 351-79 (1958); N. BARRETT, THE THEORY OF MICROECONOMIC POLICY (1974).

41. M. PRESTON, PUBLIC GOODS AND THE PUBLIC SECTOR 13-15 (1972). It would be premature, however, to conclude that this situation effectively precludes a private market. Cheung argues to the contrary. Cheung, *The Fable of the Bees: An Economic Investigation*, 16 J.L. & ECON. 11 (1973).

gested bridge or road.[42] "Pure" public goods are those which are thought to be non-rival as well as non-excludable. The defense and criminal justice systems are examples of this category of goods.

Externalities or neighborhood effects occur where a person in using his own property disturbs another's use of his property (negative externality) or, more rarely, confers a benefit upon him (positive externality), without that person, in deciding upon such use, taking the disturbance or the benefit conferred into account. Bee-keeping and flower-growing create reciprocal positive externalities.

Public goods and externalities both create the problem that private property rights appear not to function properly and hence not to perform their information and incentive functions. Traditionally, economists have recommended corrective government action to provide public goods and to "internalize" externalities by means of taxes. But this conclusion is premature, as Cheung's empirical study of the bee-and-flower example illustrates and as Coase demonstrated generally in his classic article on social cost.[43]

2. *Externalities*

As for externalities, Coase showed that the concerned parties would internalize them, provided that the legal system determined who had what rights. Should the legal system distribute the rights in a manner not optimal for the parties concerned, negotiation between parties would shift them to the party valuing them most. The distribution of rights would, however, be reflected in the prices of the properties in question.

What if negotiations are too costly for rights to be shifted? It might be tempting to consider these transaction costs a cause of market failure, but this conclusion would be misguided. Coase has stressed this himself in the last part of his article and in the Notes to it in the 1988 re-publication, as has Dahlman.[44] The concept of externality is vacuous. We may think that rights would be better placed in the hands of others. We may regret that transaction costs prevent a trade from taking place, but if the parties concerned do not reach such an agreement, the cur-

42. M. PRESTON, *supra* note 41, at 14.
43. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960).
44. Dahlman, *supra* note 39, at 143, 143-150.

rent situation is the best attainable. For instance, oil may be known to exist in tar sands and yet it may be uneconomical to bring it to market at current prices. Under known technology, the best decision is to leave the oil where it is. There is no market failure, merely an incentive to discover cheaper ways of refining oil from tar sands.[45]

To say that there is an externality is either a moral judgment or a prediction of trades that would take place if transaction costs were reduced. Such a prediction would provide incentives for innovators and entrepreneurs to look for ways of reducing transaction costs. Government intervention may provide such a reduction, but it is by no means guaranteed that it will in all instances, nor is it obvious how the cost advantage could be measured, since the government usually displaces the market.

3. *Public Goods*

Public goods create positive externalities for a very large number of people. The problem, however, is that the public lacks incentive to pay for them. This is so because all beneficiaries make the calculation that, once the good has been produced, they can use it free of charge (exclusion being impossible by definition). Since everyone reacts in the same way, the total amount people would pay for the collective good is understated and the good is either not produced or "underproduced" relative to the "true" needs of the beneficiaries.

Similarly, if a public good were already available, nobody would have an interest in limiting his or her consumption of it. Hence, the public good would be treated as a free good and subject to "over-consumption." This would explain the pollution of the environment and the overfishing of the seas. This has come to be known as the problem of the commons.[46] Analytically, the problem can be seen as a game of prisoner's dilemma played among numerous players.[47] The solution which

45. *See* Cheung, *The Structure of a Contract and the Theory of a Non-Exclusive Resource*, 13 J.L.ECON. 49, 56 (1970). *See generally* S. CHEUNG, THE MYTH OF SOCIAL COST (1980); Dahlman, *supra* note 39.

46. Hardin, *The Tragedy of the Commons*, 162 SCI. 1243, 1244 (1968). *See generally* MANAGING THE COMMONS (G. Hardin & J. Baden ed. 1977).

47. *See* E. ULLMANN-MARGALIT, THE EMERGENCE OF NORMS 25 (1977); R. AXELROD, THE EVOLUTION OF COOPERATION 221 n.3 (1984); R. SUGDEN, THE ECONOMICS OF RIGHTS, CO-OPERATION & WELFARE 122-44 (1986); Mackaay, *L'ordre spontané comme fondement du droit*, 22 REVUE JURIDIQUE THÉMIS 347 (1988); D. PARFIT, REASONS AND PERSONS 60-61 (1986).

tends to develop is one in which each player attempts to cheat the others. This solution is all the more likely as the number of players increases. In actual life, it has a number of names: loafing on the job, shirking, cheating, free riding, or moral hazard in insurance contexts.

In the course of history, governments have undertaken to provide numerous goods and services. Perhaps at the time when government took charge, public provision appeared to be the only or the least costly way of producing such goods or services. This historical advantage need not persist over time. In many cases of apparently public goods or services, new techniques may be found which achieve a degree of exclusivity making private property rights viable. This raises the question of whether the "public good" character of a particular service or commodity currently provided by government is contingent upon current knowledge. The answer is not easy to find. The market process which could demonstrate whether a commodity or service is viable as a private good is not available as a means of discovery. As the government takes charge of the provision of such a good, providing it through a state monopoly, it weakens the incentives for developing new techniques of exclusion. The danger is that once government has taken charge of something, the means of producing it as a private good will not be discovered and hence it will of necessity be considered a public good. The "public good" character of services provided by government would seem to be a self-fulfilling prophecy.

Is there a way out? Sometimes goods or services provided by the state in one country are successfully offered in a private market in another country. In other cases we may surmise that techniques of exclusion available somewhere in a private market could be applied to a "public good."

If the "public good" character of services and commodities provided by the state is therefore in doubt, should the doubt extend to what are thought to be the most fundamental public goods, to wit, protection against outside enemies (defense) and against internal ones (law and order). Libertarians believe that these services could be rendered privately and have suggested contractual schemes for bringing this about.[48] Others submit

48. *See, e.g.*, M. ROTHBARD, THE ETHICS OF LIBERTY (1982); P. LEMIEUX, LA SOUVERAINETÉ DE L'INDIVIDU (1987); P. LEMIEUX, DU LIBÉRALISME À L'ANARCHO-CAPITALISME (1983).

that the necessary defense associations would "fight it out" and that one would come to dominate. For any one territory, these basic protections would end up being the monopoly of the state.[49]

In what follows we shall accept the thesis that the state is in charge of this basic protection—protection of last resort—and has the monopoly of coercive force. One of the basic functions of the state is hence guaranteeing property rights. Hayek writes: "It would seem that no advanced civilization has yet developed without a government which saw its chief aim in the protection of private property, but that again and again the further evolution and growth to which this gave rise was halted by a 'strong' government."[50]

4. *Some Techniques Used to Ensure Exclusivity*

"[E]xclusivity is frequently a matter of degree."[51] It may be of interest to give examples of how a measure of exclusivity has been realized for commodities or services that might be considered "public goods."

We have already mentioned the arrangements worked out between bee-keepers and flower-growers. A similar textbook example of a public good which proved to be false is the lighthouse. Coase showed how historically lighthouses in England were run by private initiative.[52] Stroup and Baden have shown how protection of the environment can be organized privately.[53] Where goods or services appear to be public but only to a limited group, they may be provided through the "club formula," which Buchanan has analyzed.[54] Olson has similarly shown how membership in large associations is made attractive by providing, along with the public good of membership, a variety of private goods.[55] In some fast-moving industries, a head start in bringing to market a product which becomes commonly

49. These are the only legitimate functions for government in Nozick's minimal state. *See* R. NOZICK, ANARCHY, STATE AND UTOPIA (1974). Historically, this process seems plausible. *See* J. BAECHLER, *supra* note 18, at 69. D. NORTH, *supra* note 22, ch. 3. It is interesting to note that international law admits of only one state for any territory.

50. F. HAYEK, THE FATAL CONCEIT (1988).

51. Cheung, *supra* note 45, at 27.

52. Coase, *The Lighthouse in Economics*, 17 J.L. & ECON. 157 (1974).

53. R. STROUP & J. BADEN, NATIONAL RESOURCES: BUREAUCRATIC MYTHS AND ENVIRONMENTAL MANAGEMENT (1983).

54. Buchanan, *An Economic Theory of Clubs*, 32 ECONOMICA 1 (1965).

55. M. OLSON, THE LOGIC OF COLLECTIVE ACTION (1965).

accepted soon afterwards creates a degree of exclusivity. Where the participation of many people is necessary for a project to be undertaken, free riding can be counteracted by offering subscriptions to the project beforehand and only undertaking it if the requisite number is forthcoming.

Techniques for ensuring exclusivity evolve, as does their cost. One need only think of the effect of the invention of barbed wire on methods of cattle breeding. A recent example is the cost of assigning seats: in cinemas, seats are no longer assigned, whereas they still are in theaters.

These examples are a mere sample. They do not imply that in all cases private provision is possible. They do illustrate, however, that one should not too soon doubt human ingenuity. Theory is no substitute for entrepreneurial spirit.

D. *The Legal Recognition of Property Rights*

In legal language, property rights are entitlements whose exclusivity may be ensured by recourse to the state's coercive power. We have argued above that exclusivity may be ensured by other means as well (resulting in a de facto property right). In this sub-section, we examine the circumstances under which property rights are recognized in law. Recognition of such a right is a decision by judicial or political authority. Political authority also grants—and lends its power to enforce—other entitlements or privileges of widely different kinds such as taxi permits, closed shop laws, or subsidies for agricultural products. The distinction between property rights and privileges is the subject of the second sub-section.

1. *The Evolution of Property Rights*

The idea of property as a protected domain for individuals or groups is quite fundamental to human society.[56] Hayek writes that "[t]here can be no question now that the recognition of property preceded the rise of even the most primitive cultures."[57] Where initially only a few aspects of life were governed by individual exclusive rights, it is not difficult to imagine a process whereby such rights were made transferable and progressively extended to other kinds of resources. As Furubotn

56. *See* R. SUGDEN, *supra* note 47 (a game-theoretic explanation of why this might be so).

57. F. HAYEK, *supra* note 35, at 108.

expresses it, "changes in property rights are triggered by the interaction between the prevailing property rights structure and man's search for ways of achieving more utility."[58] This process of extension of property rights may have taken different routes among different groups; it is still going on today.

How does the state become involved? In its simplest form, we may analyze the state as a trade between a ruler and individuals. The ruler provides defense and justice in exchange for revenue provided by the people.[59] We need not be concerned whether the trade occurs as a social contract in which a ruler is chosen, or results from the conquest of power by the ruler. In practice the arrangement is virtually universal, and one must presume that the solution of having a single supreme authority over a territory has proved superior to the alternatives. It is a moot point whether this means that there are insuperable economies of scale in providing defense and justice as a monopoly (a public good) and whether those economies of scale are permanent.

In restricting himself to these two functions, the ruler may legitimately become involved in the enforcement of property rights and the performance of contracts used among his subjects, as well as in the recording of these rights. Both functions reduce the possibility of conflict and hence tend to ensure the revenue base for the ruler. To simplify the collection of revenue, the ruler may decide to "sell" exclusive rights to particular individuals or groups. Of course, once a right has been awarded, the ruler is not at liberty to revoke it at will or to award conflicting rights to others. Obviously, these trades must be advantageous to both sides. Hence, the beneficiaries of the rights must expect higher revenues with the rights than without, the gains being in excess of what the ruler has to be paid. For both sides, the agreement is based on speculation.

This "trading" sets in motion a process whereby rulers become entrepreneurs in recognizing or awarding rights, tax revenue being the lure. The history of Western Europe in particular can be read in this manner. Some rulers made better decisions than others, but most likely, it was not obvious at the time who was right. Only competition among states, with citizens being able to "vote with their feet," would permit one to

58. THE ECONOMICS OF PROPERTY RIGHTS 9 (E. Furubotn & S. Pejovich ed. 1974).
59. *See* D. NORTH, *supra* note 22, at 23.

discover in the long term which rights structures performed best.[60] Where have we come since? From merely recording the law and granting rights for taxation purposes the legislature has moved to actually molding the law. Rights may be granted by legislation to any group that can make itself heard politically. The powers available to police these rights are considerable. De Jouvenel writes on this subject:

> [O]ne observes on the contrary that the evolution from monarchy to democracy has been accompanied by a prodigious development of the means of coercion. No king has had at his disposal a police force comparable to that of modern democracies.[61]

The extension of property rights to new objects has continued. One can "sell" one's practice (clients), one's know-how, and futures of all sorts. It would appear that anything of value in trade can be made the object of a property right, although the recognition in the legal system varies from case to case. The only requirement seems to be that the interested persons can shape such value by means of some physical control (exclusivity) and a more or less elaborate contractual structure.

2. *Property Rights and Privileges*

State power can be used to recognize and enforce property rights as well as privileges, which are forms of monopoly. Both require exclusivity, both represent a value to the beneficiaries. What, then, distinguishes rights from privileges?

Law, in the sense of property rights and contracts, enforced by state power, is a "prelude to almost any economic relationship . . . . [It does not] inhibit but rather make[s] possible competition (as a process)."[62]

Monopoly, by contrast, has a bad name among economists.

60. Many scholars argue that the fragmentation of power and the resulting competition among small states in Western Europe explains why economic progress took off there and not, for instance, in China, which had a much older civilization but was stifled under unitary rule and the mandarin system which blocked innovation. *See generally* J. BAECHLER, *supra* note 18; P. KENNEDY, THE RISE AND FALL OF THE GREAT POWERS (1988). For the theory that the revival of European civilization owes its origins to political anarchy, see F. HAYEK, *supra* note 50.

61. "[O]n constate au contraire que le progrès de la monarchie à la démocratie s'est accompagné d'un prodigieux développement des instruments coercitifs. Aucun roi n'a disposé d'une police comparable à celle des démocraties modernes." B. DE JOUVENEL, DU POUVOIR 49 (1972).

62. G. O'DRISCOLL & M. RIZZO, THE ECONOMICS OF TIME AND IGNORANCE 155 (1985).

In the neo-classical approach, it is regarded as an instance of market failure and a case for intervention either by competition law, to break up firms that are too large or to prohibit their pernicious practices, such as price discrimination, or by regulation, for what were considered "natural monopolies." Detailed study of the way in which regulation functions in practice as well as the practical difficulties encountered in applying competition law (what is the relevant market, what is market power) has led to a revision of the picture of monopoly as it emerges from the neo-classical approach. This revision has given prominence to the approach Austrian economists have taken all along towards monopoly.[63]

In this revised view, competition must be seen as a process, in which "[b]usinessmen pursue strategies to discover a combination of customers and services with respect to which they have an advantage over those whom they perceive as their competitors."[64] Through competition, entrepreneurs may acquire a position in which they are the only suppliers of a particular service or commodity. They may exploit their situation by charging what appear to be excessive prices. Yet the monopolist is always subject to potential competition from elsewhere, and hence, must always be on his toes. The apparent advantage is constrained by potential competition, and an outsider cannot determine what the required reward is. In attacking the alleged monopolistic abuse, one destroys, or at least redirects, the entrepreneurial spirit which drives the market process. Such action seeks short-term gain for consumers at their expense in the long-term.

In this perspective, monopoly cannot exist in a competitive economy. The symptoms attacked as monopolistic are part of the competitive process over the longer run. Only government intervention can create monopoly by creating impediments to entry into a market or prohibiting particular practices. Legal barriers to entry, it is said, confer a "property right" of a market share upon firms already in the market.

One may wonder whether the analysis has been pushed to its limits. To protect a firm from competition, one would have to

63. *See* Hayek, *The Meaning of Competition*, in INDIVIDUALISM AND ECONOMIC ORDER 92-106 (1946); I. KIRZNER, supra note 19; G. O'DRISCOLL & M. RIZZO, *supra* note 62; R. BRENNER, *supra* note 20; R. BRENNER, RIVALRY: IN BUSINESS, SCIENCE, AMONG NATIONS (1987) [hereinafter R. BRENNER, RIVALRY].

64. R. BRENNER, RIVALRY, *supra* note 63.

ensure that no product was offered that competed with that firm's product, and that no other firm could enter its market. But what is that market? The boundaries that may be located by measuring cross-elasticities are precisely what competition may seek to change. The high returns in the secured market are the lures necessary for developing a new parallel market. Human ingenuity is not stopped by legislation, it is redirected.[65]

But does not an ordinary property right entail a measure of monopoly? What about the property of rare talents, rare blood, particularly fertile or well-located land? Ownership of a piece of land in the hands of a "hold-out" may look like a monopoly to the person who seeks to buy it as part of a larger project. A landlord is said by some to have a "situational monopoly" with respect to tenants as a result of the costs of moving. Consider the Metropolitan Toronto Zoo, which has contracted with McDonald's for the eateries all over its territory. No one would dispute McDonald's right to do so, yet the necessary result is that competing caterers are prevented from presenting themselves directly to the Zoo's visitors. Here again, competition must not be examined in too narrow a manner. There may be less choice than if five distinct restaurants had been signed on, but McDonald's apparent monopoly may stimulate alternative take-away food suppliers outside the Zoo, or people may carry their own food in. Those running other forms of amusement may convince potential zoo visitors that their activity is a substitute to the Zoo itself.

The exclusivity inherent in a property right is a form of monopoly. How this monopoly affects competition depends on what customers will accept as substitutes. Competition is a matter of degree. The power to create effective monopolies, even by law, is inversely related to the ease with which consumers can find substitutes. The type-setters union may have once had a powerful monopoly, but with the appearance of computer type setting and subsequent "desk-top publishing", the monopoly has retained little worth. It is difficult to determine whether the force of the union's privileges has been an effective incentive in the development of computer type-setting or desk-top publishing, but in any event, the legal monopoly has not shut out competition.

65. I. KIRZNER, *supra* note 19, at 134.

What these considerations suggest is that one cannot easily draw a distinction between property rights (legitimate) and state-granted monopolies (illegitimate). Either type of right creates direct stimuli for the beneficiaries as well as incentives for competitors to circumvent their advantage. Competitors will presumably have to look further away than they would in the absence of such a right, but that is true for all competitive advantages.

What characterizes many of the traditional privileges, such as occupational and professional licensing, which limit access to the market is that the rights cannot be transferred and that they entail restrictions on use (advertising, new formulas of service). These characteristics impede the discovery procedure of the market, that is, the contractual shifting of resources to higher valued uses.

Consider the case of taxi permits, which *are* transferable. They behave like property rights since the expected stream of revenue is capitalized in their current value. Yet, it is difficult to imagine how such a system could be established through minimal physical exclusivity plus contracts. The cartel of taxi drivers could not simulate, by such means, the rights granted to them by the permit system: outsiders would presumably soon outbid them.

In conclusion, property rights and monopoly appear to lie on a continuum of rights enforced by state power. Both have incentive effects on the holders as well as on those who wish to compete with them. The crucial question is to what lengths the competitors must go to compete: the further they must go, the more stifling the right will be. In this perspective, we should be wary of rights (other than personality rights) which are inalienable and whose use is restricted. We should similarly be wary of rights whose effects could not be approximately simulated by interested parties through physical exclusivity and contract.

III. Incentives to Produce Information

A. *Information*[66]

1. *Nature*

" 'Information' in most, if not all, of its connotations seems

66. For a useful survey of this issue and of the law relating to information, see

to rest upon the notion of 'selection power.' "[67] Cherry, from whom this quotation is taken, explains, "Information can be received only where there is doubt; and doubt implies the existence of alternatives—where choice, selection, or discrimination is called for."[68]

Economics is about choice, which requires information as its basic ingredient. The amount of information required is literally infinite. Everyone has an enormous amount of information concerning his personal life. One wants to know what to buy, where to buy, at what price and under what conditions, what to produce, and how to do particular things.

All of this information is continually subject to obsolescence and must therefore be constantly updated. O'Driscoll and Rizzo state that "[u]nexpected change is inevitable and ignorance is ineradicable."[69] It is therefore to be expected that information is one of the most important commodities which the economy produces.[70] The search for information and its use go on continually. Information is literally everyone's business and expresses each individual's autonomy.

Transaction costs, the cornerstone of the economic analysis of law, are the result of imperfect information. They can be lowered by the availability of better information.[71] Information is at the root of the market process, which itself generates even more information. Information "can be considered a necessary prerequisite for the production of all private goods."[72] Or as Hayek puts it, "[T]he market process, though one of the most efficient instruments for conveying information, will . . . function more effectively if the access to certain kinds of information is free."[73]

Gutwirth, *Het juridisch statuut van informatie*, in RECHT EN TECHNOLOGIE 194 (P. de Vroede ed. 1987).

67. C. CHERRY, ON HUMAN COMMUNICATION 244 (1966). On the general nature of information and its role in society, *see* F. HAYEK, *supra* note 27, at 33.; Hayek, *The Use of Knowledge in Society*, in INDIVIDUAL AND ECONOMIC ORDER 77 (1948); F. HAYEK, 3 LAW, LEGISLATION, AND LIBERTY: THE POLITICAL ORDER OF A FREE PEOPLE 60 (1979) [hereinafter F. HAYEK, POLITICAL ORDER]; *see also* E. MACKAAY, ECONOMICS OF INFORMATION AND LAW (1982).

68. C. CHERRY, *supra* note 67, at 170.

69. G. O'DRISCOLL & M. RIZZO, *supra* note 62, at 4.

70. F. KNIGHT, UNCERTAINTY, RISK, AND PROFIT 260-61 (1921).

71. Dahlman, *supra* note 39, at 141, 217.

72. THE THEORY OF MARKET FAILURE: A CRITICAL EXAMINATION 21 (T. Cowen ed. 1988).

73. F. HAYEK, POLITICAL ORDER, *supra* note 67, at 60.

2. *Cumulative and Non-Deteriorating Character*

In many instances, our current lifestyle incorporates discoveries and practices of previous generations. This is illustrated in our buildings, our machines, our languages, our scientific knowledge, and our law. Such information is cumulative. The accumulation of knowledge is possible because, unlike physical commodities, information does not deteriorate through use, although it may lose its value as a result of the discovery and use of other (competing) information. Moreover, information, unlike physical commodities, cannot be destroyed, stolen, or restituted in the sense these terms have for physical commodities.

3. *Non-Rival Character*

In many circumstances, information is non-rival, that is, use of it by one person does not diminish its usefulness to others. This principle applies to the novels one reads, the music one listens to, and the films one watches. For languages, customs, and rules coordinating people's behavior, the non-rival character goes even further since they become more valuable as the number of users increases. Yet, there exist kinds of information which are rival in the sense that the first or the sole possessor is able to gain the greatest value from its use. This is true, for instance, in the case of knowledge which gives one a competitive advantage (for example, a trade secret) and for information relating to future events, which allows one to speculate on forthcoming price changes (for example, the lifting of a blockade or a projected take-over).

4. *Problems of Exclusivity*

The exclusivity of information is generally difficult to maintain. Fundamentally, it can only be achieved through secrecy. Punishment of treason is one of the ways in which the law underscores the importance of secrecy as a means of maintaining exclusivity.

Secrecy is an adequate means for securing exclusivity of information one desires merely to keep for oneself. Yet, secrecy poses problems as soon as information is shared with others (which happens in education and generally in all forms of knowledge that are cumulative). Every person brought into a

secret can share it with still others, and it is increasingly difficult for the initial holder to control who will ultimately use the information. The problem is particularly troublesome where information can be produced only as a result of special efforts and expense. In such a situation, one must consider how to prevent subsequent holders of information from establishing themselves as competing distributors of the information, reaping the benefits of the efforts of the developer without sharing the costs.

Distribution of information that is not readily memorized can be controlled through the support (host) conveying it. Information in a manuscript, for instance, could be kept relatively exclusive by the mere fact that copying it by hand would take a full year. Technical advances have made the copying process easier and have diminished the dependence of information on particular supports. Means of exclusion appropriate at earlier stages of technical development have correspondingly become obsolete. This process unleashes powerful forces looking for new ways of ensuring exclusivity and for new ways of circumventing them. At present, this is particularly evident in the music and computer software industries. It is not limited to information, however. Consider, for instance, the refinements developed to prevent car theft.

A variety of techniques are available for securing a modicum of exclusivity for information. Where information is highly individualized, such as medical diagnosis, legal advice, or accounting, the professional can achieve exclusion by the threat of withholding service. For information which must be made uniformly available to a great many people, the solutions are not so simple. In some cases, technological "fences" exist. Examples include drive-in cinemas, write-once-read-many-times (WORM) devices, and physical or programmed copy protection for software. Where copy protection is removed, special advantages are available to legitimate owners of copies such as on-line help and low-cost upgrades (a so-called tie-in). Another example of a technological fence are television signals provided by cable or scrambled. Some information is sold as an implicit by-product embodied in a physical product, such as quality information about that product, conveyed by the reputation of the store in which it is sold. Olson gives a wealth of

examples of such tie-ins.[74]

In some individualized software contracts, the client receives only the object code of the program so that he must deal with the original supplier for each modification. A further possibility is varying the medium used to convey the information for those who want it first hand or before others. They may buy tickets to a game, as opposed to seeing it on television. Similarly, those who want to read John Le Carré's new book now must pay $27.95,[75] while others, who are willing to wait, can purchase the much cheaper paperback edition a year hence. Similar price discrimination takes place when publishers sell subscriptions at a higher price to libraries than to individuals. In libraries, photocopying will inevitably take place. Vendors have discovered a number of exclusionary techniques for information, even though it seems at first blush to be one of the purest public goods. This is not say that these techniques work perfectly, in the sense of the proportionality criterion stated in section II(A), but then exclusionary techniques for physical commodities are not foolproof either. Transaction costs are never absent in the real world.

5. *Scarcity*

The foregoing discussion presupposes that information is scarce. Abundance obviates the need for exclusivity. An incidental remark by Hayek gives cause for reflection. He writes: "[M]uch knowledge once acquired is in its nature no longer a scarce commodity and could be made generally available at a fraction of the costs of first acquiring it."[76] The argument is not altogether convincing. One might say by analogy that in Western countries, because of the surpluses, grain is no longer scarce. Government could make these surpluses available at a fraction of the cost of initial production. Similarly, theatre seats which remain empty just before the start of the performance could be occupied by outsiders without reducing the enjoyment of those who have already bought seats. Yet this is not

74. M. OLSON, *supra* note 55, at 132; *see also* Brubaker, *Free Ride, Free Revelation, or Golden Rule*, 18 J.L. & ECON. 147, 156 n.17 (1975); Goldin, *Equal Access vs. Selective Access: A Critique of Public Goods Theory*, 29 PUB. CHOICE 53, 58 (1975).

75. Canadian dollars, Spring, 1989.

76. F. HAYEK, POLITICAL ORDER, *supra* note 67.

taken to imply that theatre seats are not subject to ordinary property rights and market conditions.

For existing goods, scarcity is reflected in conflicting uses. Scarcity forces people to make a choice among those uses, or develop rules determining how and by whom such a choice is made. Scarcity imposes a need for prudent administration. For commodities and services to be produced, the scarcity problem presents itself for each of the inputs that is not abundant. Private property rights establish a direct link between scarce inputs and the resulting output. Property rights in the output (and the possibility to sell it in the market) provide the measure for the wisdom of combining the inputs to produce it: they reward the producer. They are at the same time a signal for those contemplating producing similar outputs. Once someone has produced a new good, its production costs are sunk and not subject to choice. In this sense, the good might appear to be "abundant." Yet the scarcity question still exists. It bears upon the issues of whether more of these goods should be produced, by whom, how, and for whom. Only by letting the good be sold in the market shall we discover the correct answers to those questions.

The question, therefore, becomes whether the inputs required for generating particular information are scarce, that is, whether they have alternative uses. In some instances, one produces information as a necessary by-product of activities undertaken for other reasons. Living in a house, for instance, makes one familiar with many of its characteristics. This information may be considered practically free. The law recognizes this by obliging a vendor to divulge to the purchaser all latent defects known to him. It requires little effort, however, to show that in other cases, one undertakes activities and expenses for the express purpose of finding new information. If this information can be useful to others, property rights in it provide the correct measure of its scarcity.

6. *Conclusion*

Information is the life blood of the economic process. In theoretically analyzing it, one of the problems is precisely the variety of roles it plays. In some cases, information is costly. Its production requires resources and will occur only if one pays for the information. This leads to the question of whether

property rights in information are viable. At first blush, they would seem to be problematic; information does not deteriorate with use, its consumption is frequently non-rival, and in many cases, it is accumulated over time. Since information is ever more volatile (less tied to particular hosts), exclusivity would seem to be a problem. Fortunately, producers have found a variety of techniques for ensuring a measure of exclusivity. As a result of these techniques, information can be economically created. We must now examine what the law contributes to this arsenal of techniques.

B. *Protection of Information in Existing Legal Systems*

1. *Law with Respect to Information in General*[77]

a. *Truthful Information*

If information is basic to the market, one might expect that legal rules will exist to sanction false information. There exist a variety of such rules. In contract law, each party must provide truthful information to the other. Courts can void contracts concluded as a result of a mistake about a fundamental term or about the nature of the operation. Where one party has seriously misled the other, the courts will void the contract for fraud, with damages. Fraud is also sanctioned in criminal law. In principle, these rules could be extended to truthfulness and minimal content of labeling and grading of products as well as advertising. In most cases, special legislation has been adopted to this end.

b. *Free Circulation of Information in Principle*

Generally, the law treats information as circulating freely (not subject to property rights). Exceptions are recognized only where the interested party attempts to maintain exclusivity and is moderately successful at it.

c. *Reputation and Image*

Reputation or good will of a firm reduces the search costs for prospective clients. It reflects a deliberate and usually long-term investment in practices that create confidence among cli-

77. The discussion is based on general principles found in civil law systems. I am confident that comparable principles can be found in common-law systems.

ents. Reputation may be associated with trade names and trademarks. The law will sanction activities designed to imitate these as passing-off. Publications or other activities that falsely harm the reputation of a firm or a person are subject to sanctions by damages or even by injunction. Similar rules apply to the images of public figures (media and sports stars). Courts can sanction unauthorized actions to exploit their image commercially.[78]

d. *Privacy and Secrecy*

Basic to civil society is the freedom of individuals to pursue their own ends.[79] The law protects this interest against the inquisitiveness of neighbors, other members of the public, the press, and the government. Traditionally, courts have accomplished this by libel laws and prohibition of extortion at criminal law. In modern times, the law has added further rules against invasion of privacy through snooping, eavesdropping, candid cameras, and so on.[80]

2. *Law with Respect to Confidential Information*

We now turn to the rather fuzzy areas of law protecting confidential information. The schemes used here are an alternative to patent and copyright. They draw on the law of trade secrets, of unfair or parasitical competition (passing off), of abuse of confidence (trust), on non-competition and confidentiality clauses or agreements, and on confidentiality obligations (fiduciary duties) resulting from the position one occupies. Together these fields of law form, as a recent report expresses it, "an umbrella [which] is not however a total protection from the elements—in this case trade secret pirates . . . ."[81]

a. *Conditions for Protection*

For information to be protectable as a trade secret or as con-

78. Weinrib, *Information and Property*, 38 U. TORONTO L.J. 117, 125 (1988).

79. *See* F. HAYEK, POLITICAL ORDER, *supra* note 67, at 63.

80. It should be noted that in the United States these rights of action are subject to sometimes severe restraints imposed by the constitutionally guaranteed right to "free speech." *See, e.g.*, New York Times Co. v. Sullivan, 376 U.S. 254 (1964) (restricting, in the name of the "freedom of speech," the right to bring common-law defamation actions).

81. INST. OF LAW RESEARCH AND REFORM, UNIV. OF ALBERTA, TRADE SECRETS 71 (1986).

fidential information, several conditions must be present. First, the information must be communicable knowledge concerning production (a manufacturing process, a chemical formula, a technical method, research results, or data banks) or marketing (organization of a distribution network, consumer profiles, client lists, advertising strategies, market analyses, or joint ventures to be undertaken).[82] It may not consist of a person's skills or experience, which are considered inalienably his own, nor should it be common knowledge.

Second, the initial holder of information must have taken steps to restrict access to it. These steps need not go so far as to prevent all access by third parties, but such access must be carefully controlled. Confidentiality is assessed both objectively, that is, by looking at the measures that were explicitly taken to restrict access, and subjectively, that is, by looking at whether the holder intended the information to be kept confidential. Marketing of a product does not necessarily void the trade secrets it embodies. The trade secret persists, for example, where the product is of some complexity and the trade secret cannot be readily extracted from it or obtained by reverse engineering.

A further requirement is sometimes added that the information reflect some effort on the part of the holder or have some commercial value. Novelty or inventiveness are not formal requirements, although, as was noted above, common knowledge will not be protected as a trade secret.

b. *Extent of the Protection*

Protection of confidential information is limited. "The protection is merely against breach of faith and reprehensible means of learning another's secrets."[83] Its reach does not extend to third parties developing the same information independently and then using it themselves. Moreover, the protection is lost if the trade secret becomes common knowledge, from whatever the cause.

c. *Protection Against Actions by Employees and Management*

Trade secrets may be violated by persons with whom one has

82. Bourgeois, *La protection juridique de l'information confidentielle économique*, 1 CAHIERS DE PROPRIÉTÉ INTELLECTUELLE 1-29 (1988).

83. B. SOOKMAN, ACQUIRING AND PROTECTING INFORMATION TECHNOLOGY 4-3 (1989).

a contractual relationship as well as by outsiders. As to the former, it may originate with employees and senior personnel, or with contract partners.

With respect to employees, protection can be provided in the employment contracts through explicit non-competition and confidentiality or non-disclosure clauses. These clauses may be more severe than the "residual" trade secret protection. The non-competition clause states that the employee will not work for a competitor within a specified time or geographical area after leaving his present employment. In Canadian law, the courts accept such clauses if the restrictions are reasonably limited in time and space.[84] They may not unduly restrict the employee's mobility. Similarly, the confidentiality or non-disclosure clause states that the employee will not take with him or use in subsequent employment any confidential information which he developed or had access to during his current employment. Such clauses do not cover the personal skills, experience and aptitudes of the employee, even where they have been acquired during current employment. These clauses are considered valid if they meet the same standard of reasonableness.[85]

The obligation to respect a trade secret may also be the result of a fiduciary duty stemming from the nature of the relationship between the parties. Such a fiduciary duty is found to exist for officers, directors and senior management of companies and, in some instances, for other personnel in sensitive positions. These employees may not use information acquired in the course of their employment for personal purposes. Breach of confidence may be sanctioned in both civil and criminal law.[86]

d. *Protection Against Actions of Contract Partners*

Confidential information may also be protected in the relationship between companies engaged in a joint research venture or between licensor and licensee of technology. This can

84. *See, e.g.*, Godin v. Gary Abraham Business Consultants, R.J.Q. 809 (Superior Ct. Quebec 1986), *aff'd*, 2 Q.A.C. 317 (1986); Toulouse v. Laiterie St-Georges Ltée, C.A. 210 (Quebec Ct. App. 1978), *aff'g* C.S. 853 (1978); Cameron v. Canadian Factors Corp. Ltd., S.C.R. 148 (1971); *see also* Bourgeois, *supra* note 82, at 8; B. SOOKMAN, *supra* note 83, at 4-44 to 4-54.

85. *See* B. SOOKMAN, *supra* note 83, at 4-42 to 4-44.

86. *See, e.g.*, Canadian Aero Services Ltd. v. O'Malley, S.C.R. 592 (1974).

be accomplished through an express non-disclosure agreement, which requires each party to keep certain information confidential and to impose confidentiality on all employees who have access to the it. Should confidential information have to be passed on to subsidiaries or other outsiders, the confidentiality agreement usually contains a "chain clause" providing that access will be granted only if the outsider underwrites the same conditions of the original agreement.

During contract negotiations a similar but less severe duty exists even in the absence of such an agreement. In such cases an obligation exists to act loyally and not to use information disclosed in confidence to the detriment of the person who has disclosed it during the course of the negotiation. Failure to meet the obligation can be sanctioned in civil law through damages and injunctive relief.[87]

e. *Protection Against Actions by Outsiders*

Where no relationship exists between the parties, one party can still be sanctioned for hiring key people from his competitor in an attempt to obtain inside information.[88] Such acts are sanctioned in civil law as unfair competition, as are creating confusion with a competitor's product, slandering him in the eyes of clients, and industrial espionage.

f. *Conclusion*

This area shows how the law can expand piecemeal by embracing practices adopted by interested parties. A measure of secrecy provides initial control (exclusivity) over the information. Exclusivity can be further secured by means of contract law. Where a contractual relationship exists, clauses in the contract provide the orientation points for the courts to focus on. In their absence, corresponding obligations may be read into the contract.

The problems arise when one wishes to transfer information while restricting its "resale" to third parties. This is what full

87. *See* Bourgeois, *supra* note 82, at 11; B. SOOKMAN, *supra* note 83, at 4-54 to 4-65; JEAN-LOUIS BAUDOUIN, LA RESPONSABILITÉ CIVILE DÉLICTUELLE 96 (1985); International Corona Resources Ltd. v. Lac Minerals Ltd., 44 D.L.R. 4th 592 (Ontario H.C. 1986); Santé naturelle Ltée v. Produits de nutrition Vitaform Inc., C.S. 628 (Quebec Superior Ct. 1985).

88. *See, e.g.*, Telex Corp. v. I.B.M., 510 F.2d 894 (10th Cir.), *cert. denied*, 423 U.S. 802 (1975).

exclusivity of a property right is supposed to allow the owner to do. With "chain clauses," one may attempt to extend contractual restrictions to third parties. The difficulty is, especially when one has to contract with a great many individuals, that the chain may be broken without the information "owner" being able to trace the source of the "leak."

The law provides, in some cases, for a limited action against the third party directly.[89] Such an action has the effect of "closing" the system[90] and conferring upon the information "owner" what is in fact a simulated property right. The emergence of such a right is largely under the control of the person who seeks it: it is founded on physical control and contract. Contract may be said in such cases to be the laboratory for what ultimately may be codified as fully fledged property rights.

C. *Patent and Copyright*

1. *Historical Notes*

Both patent and copyright have their origin in privileges granted by authorities during the Fifteenth to Eighteenth Centuries. This is not surprising, since these rights were novel at the time, and privileges were, as was shown above, one of the instruments through which rulers exercised their "justice" function. Nor is it surprising that these rights should emerge for the first time at the end of the Middle Ages, with the invention of the printing press and the acceleration in the rate of new inventions. This is simply part of the process described by

89. In Quebec law, this action is based on art. 1053 of the Civil Code. Every person capable of discerning right from wrong is responsible for the damage caused by his fault to another, whether by positive act, imprudence, neglect, or want of skill. *See* Bourgeois, *supra* note 82, at 11; JEAN-LOUIS BAUDOUIN, *supra* note 87; Hébert & Fils v. Desautels, C.A. 285 (Quebec C.A. 1971); Commodore Business Machines Ltd. v. 116772 Canada Inc., C.S. 1186 (Quebec Superior Ct. 1983); Acme Vacuum Cleaner Co. Ltd v. Acme Vacuum Cleaner Co. Ltd, B.R. 188 (Quebec C.A. 1953).

90. This argument has been brought to the fore in the debate in Canada following the *Stewart* case about whether the courts could recognize the offence of theft of information. *See* Weinrib, *supra* note 78; Mackaay, *La reproduction par la mise en mémoire sur ordinateur en droit canadien*, 46 REVUE DU BARREAU DU QUÉBEC 759, 766 nn.33-34, 767 n.35 (1986). The Ontario Court of Appeal had accepted the possibility in a split decision. *See* Regina v. Stewart, 5 C.C.C.3d 481 (C.A. Ont. 1983). The Supreme Court of Canada refused it in a unanimous decision, explicitly leaving such a step up to the legislature. *See* Regina v. Stewart, 1 S.C.R. 963 (1988); *see also* Hammond, *Theft of Information*, 100 L.Q. REV. 252 (1984); Hammond, *The Misappropriation of Commercial Information in the Computer Age*, 64 CAN. BAR REV. 342 (1986). For a comparable discussion in the United States, see Coffee, *Hush: The Criminal Status of Confidential Information after McNally and Carpenter and the Enduring Problem of Overcriminalization*, 26 AM. CRIM. L. REV. 121 (1988).

Furubotn in which humans, in their search for more utility, start from existing property rights and proceed to fashion rights for new kinds of objects.[91] There is, furthermore, nothing alarming about the fact that the rights for a particular kind of object change over time. For immovable property, this process is evident in the change from the feudal system to our present one.

How are new property rights fashioned? It would be preferable to see them take shape in experimental form before codifying them into law. Such a process has taken place since the beginning of the century with respect to experimentation and breeding of plant species. Marie-Angèle Hermitte describes what happened in France.[92]

The first firms specializing in plant breeding had appeared at the end of the Nineteenth Century. Before that time, farmers and some isolated amateurs had engaged in this activity with little success. By the end of the Nineteenth Century, scientific knowledge had progressed to the point where industrial research and application of plant breeding techniques appeared promising.

What had to be put in place was a structure for rewarding the experimenters and for ensuring at the same time that they would be interested in how their discoveries fared in practical applications. A request for horticultural property rights was first formulated in 1904. This request was definitively rejected as nonsensical by 1920 on the ground that nature could no more be appropriated than the air, the sea, and the water flowing in the rivers.

Upon the refusal of a legally recognized property right, contractual structures to the same effect were put in place. Growers set up associations and cooperatives according to specialty. The industrial development of new varieties of plants takes place in three successive stages: production of the variety, preservation, and large-scale breeding. In due course, these stages became the work of different firms. This structure presupposes precise contractual arrangements between the firms involved: an horticultural license agreement between the first two and a breeding contract between the second two.

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91. THE ECONOMICS OF PROPERTY RIGHTS, *supra* note 58.

92. Hermitte, *HISTOIRES JURIDIQUES EXTRAVAGANTES: LA REPRODUCTION VÉGÉTALE*, in L'HOMME, LA NATURE ET LE DROIT 40 (1988).

It is interesting to examine what this latter kind of contract was supposed to do. For the flower contracts, for instance, the growers had to undertake to specialize in cut flowers to satisfy various quality requirements and to allow inspection. They also undertook not to transfer any element permitting reproduction and to destroy their plantation in case of dissolution of the contract. Finally, of course, royalties had to be paid.

The interesting aspect of this structure is that with a modicum of exclusivity at the outset (access to new seeds), contracts were sufficient to ensure what Hermitte terms a "closed system."[93] This structure was translated into law by 1970. In Hermitte's view, the period from 1904 to 1970 cannot be characterized as a legal vacuum; on the contrary, she sees it as "the time required for the infrastructure in which the law can function to take shape."[94] This lead-time allows the various segments of the legal profession, under pressure from parties whose interests are at stake, to develop the form that rights should ultimately take.

2. *The Status of Patent and Copyright*

a. *Realism in the Law*

An examination of the law of patent and copyright in existing legal systems reveals that rights are defined only insofar as they can be realistically enforced. Ideas, scientific principles, and mathematical formulas are not protected. Even in areas that are amenable to protection in theory, further requirements limit what can effectively be the object of a property right. Inventions must be novel, inventive (not obvious), and susceptible of industrial application. It requires little argument to demonstrate that the protection of current or obvious ideas would be practically impossible. In the field of copyright, the requirements vary somewhat between the countries which follow the English tradition and those that follow the French tradition. In either case, only expressed ideas are protected against various forms of "borrowing" of the expression.

The idea itself must be original, which, in the French tradition, means an expression of the author's personality. The Eng-

93. *Id.*

94. "le temps nécessaire pour que se mette en place une structure d'accueil pour le droit." *Id.* at 49.

lish tradition only requires that the work not be a copy of something else and that some effort have gone into its development. Again, protection against copying or translating the expression appears to be more readily enforceable than protection against indirect forms of drawing inspiration from an existing work.[95] Some measure of copying is usually permitted as fair use, since a total ban would be practically unenforceable.[96]

In recognizing a property right in certain forms of information, the legislator complements what can be achieved by a simulated property right (practical exclusivity plus contracts with chain clauses) by adding the possibility of systematically ensuring exclusivity against third parties. We have argued above that this added power should be available only where a simulated right might be viable and that in all instances the interested parties must play an active role in the enforcement of exclusivity. For both patent and copyright, this test would be met. One can imagine copyrighted work and patented inventions being made available on conditions defined in contracts containing chain clauses. Both rights respect the proportionality criterion formulated in section II(A).

b. *The Monopoly Question*

The question of whether patent and copyright constitute monopolies is in our view misdirected. All property rights entail some measure of monopoly in that they are exclusive. Kitch expresses it very well:

> [T]he ownership of patents is no different than the ownership of any other property right necessary as an input, and that we should no more assume that the owner of a patent is a monopolist than we should assume that the owner of par-

95. This difficulty is apparent in the "look-and-feel" cases decided by the American courts over the past ten years. *See generally* Johnson Controls, Inc. v. Phoenix Control Systems, Inc., 886 F.2d 1173 (9th Cir. 1989) (preliminary injunction issued where defendant's computer program captured the "total concept and feel" of plaintiff's program); Aliotti v. R. Dakin Co., 831 F.2d 898 (9th Cir. 1987) (no infringement where defendant's stuffed dinosaurs were not substantially similar to protected product). Among the most recent cases are suits by Apple Computer against Microsoft and Hewlett-Packard for allegedly "stealing" the "look-and-feel" of certain visual components of the Apple Macintosh and Apple Lisa. Apple Computer, Inc. v. Microsoft Corp., 709 F. Supp. 925 (N.D. Cal. 1989); Apple Computer, Inc. v. Hewlett-Packard, 717 F. Supp. 1428 (N.D. Cal. 1989).

96. Gordon, *Fair Use as Market Failure: A Structural and Economic Analysis of the Betamax Case and Its Predecessors*, 82 COLUM. L. REV. 1600, 1602 (1982).

> ticularly fertile land, especially productive skills, or of an advantageous location is a monopolist.[97]

and:

> A patent can have value like any input that gives a firm a comparative advantage over its competitors, but that does not mean that the owner of the patent owns a "monopoly."[98]

Moreover, patent and copyright are available to the open class of all persons with bright ideas. Demsetz broaches the issue as follows: "[S]ince everyone has the right to take out a patent or a copyright on 'newly created' goods or ideas, does the granting of this right involve the granting of monopoly power?"[99]

The monopolistic effect of patent is perhaps stronger than that of copyright. It would be easier to circumvent the latter than the former.[100] For this reason, the term for patent protection is substantially shorter than that of copyright.[101]

Patents are only one of the elements used in competition. Firms also rely heavily on trade secrets. The cost of patents, the hazards of patent litigation and the obligation to divulge weigh heavily in that decision. Yet, if patents are not uniformly used by the intended beneficiaries, can the alleged monopoly power they entail be very profitable?

3. *Conclusion*

It is not obvious how one might conclude that patent and copyright represent undue monopoly power without reaching a similar conclusion for all property rights, that is, for the use of state power to ensure any right. The foregoing considerations

97. Kitch, *Patents: Monopolies or Property Rights?*, in 8 RESEARCH IN LAW AND ECONOMICS 31, 33 (1986).

98. *Id.* at 38.

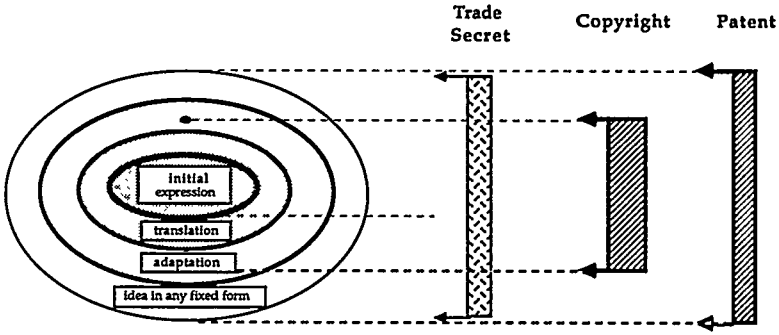
99. Demsetz, *The Exchange and Enforcement of Property Rights*, 7 J.L. & ECON. 11, 137 (1964).

100. Yet circumventing a copyright may well be difficult, as Franklin and other companies elsewhere found out in suits by Apple for infringement of the copyright on the programs embodied in the microchips of the Apple II computers. *See* Apple Computer Inc. v. Franklin Computer Inc., 545 F. Supp. 812 (E.D. Penn. 1982), *aff'd*, 714 F.2d 1240 (3d Cir. 1983); Apple v. Mackintosh, 1 F.C. 173 (1987), *aff'd*, 1 F.C. 673-713 (1988) (in Canada); Apple Computer Inc. v. Computer Edge Pty Ltd, 65 A.L.R. 33 (1986) (in Australia); 53 A.L.R. 225 (1984) (in Australia); 50 A.L.R. 581 (1983) (in Australia).

101. In Canada, section 46 of the Patent Act (R.S.C. 1985, ch. P-4) provides that the patent is granted for twenty years from the time when the request is filed; copyright is granted for the duration of the author's life plus 50 years (section 6, Copyright Act, R.S.C. 1985, ch. C-42).

lead us to the contrary conclusion that patent and copyright represent compromises between the incentive effects on the innovator and the incentive effects of the exclusion on potential competitors. Diagram 3 depicts the balance for the three rights discussed above.

DIAGRAM 3. OVERVIEW OF INTELLECTUAL PROPERTY RIGHTS



Novelty / originality	weak	weak	high
Cost	moderate	moderate	high
Duration	indefinite	life + 50 years	20 years
Protection (Against whom? What remedy?)	spotty	rigorous	rigorous
Public disclosure?	voids it	discretionary	mandatory

Whether the compromise embodied in these rights is in some sense optimal, that is, leads to the "optimal" rate of innovation in society,[102] is a vacuous question considering the ubiquity of transaction costs and the fundamental openness to the future. One can only observe that patent and copyright follow, in a general way, the logic of property rights, in particular the proportionality criterion they embody.

IV. General Conclusion

This Article was written as a reaction to the provocative theses put forth by Tom Palmer in his recent article on intellectual property.[103] The main theses of that article, which were summarized in the introduction of this Article, are restated, along with our reaction, in Table 1.

102. This is the subject of the debate between Arrow and Demsetz. *See* Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in The Rate and Direction of Inventive Activity 609 (1969); Demsetz, *supra* note 38.

103. Palmer, *supra* note 8.

TABLE 1. OVERVIEW OF THE ISSUES DISCUSSED

1. Patent and copyright are not the product of an evolutionary process. *Disagree.*
2. Patent and copyright have grown out of illegitimate privilege. *Disagree.*
3. Patent and copyright are not species of property rights. *Disagree.*
4. Rights cannot be created at will by the authorities. *Agree.*
5. Patent and copyright must not be justified by appealing to (static) efficiency. *Agree.*
6. Our thinking faculties cannot be the object of alienable property rights. *Agree.*
7. Spurs to innovation are present in the market, without state intervention. *Agree.*
8. The alleged "public good" character of information does not justify state intervention. *Agree.*

The first three theses seem to be mistaken: that patent and copyright are not the product of an evolutionary process, that they have grown out of illegitimate privileges, and that they are not species of property rights. We are in agreement with the other five.

To arrive at these conclusions, we have examined property rights: the abstract core and the variations in practical implementation; the information and incentive effects and the proportionality that property rights establish between the individual's efforts and the utility they produce to others.

Property rights require exclusivity for the owner. We have explored the means of ensuring such exclusivity as well as its effects. Exclusivity may be ensured by interested individuals, even with respect to many "public goods," as well by the state in its police function. An important conclusion of this analysis is that physical exclusivity and contract law are sufficient for simulating the workings of property rights such as the state guarantees them. The equivalent of property rights can be realized without state intervention; hence there are means of "prefiguring" the forms in which property rights might be codified. Legal rules with respect to property rights clearly require the owner to play a role in maintaining exclusivity of what is his, and they do not decree the maintenance of exclusivity by

the state far beyond what the interested persons themselves could generally ensure.

Exclusivity guaranteed by the state is at the root of legal property rights. It is also at the root of state-granted monopolies. What distinguishes the two? The recent debate about the nature of monopoly and competition has led to the conclusion that in an open market, monopoly cannot exist. Competition is always around the corner. Competition may come from very unexpected corners. The nature of the competitive discovery process is that competitors may redefine with whom they are competing. In this view, only government interference in the form of barriers to entry or restrictions on competitive strategies can create monopoly.

But perhaps the notion of competition should be drawn out further: even with government restrictions, competition is always around the corner, though the corner is surely farther away than it would be otherwise. Conversely, ordinary property rights have monopolistic effects where they concern such characteristics as unusual talents or particularly fertile or strategically located property. This is much like any other competitive advantage. Exclusivity ensured by government does not preclude competition; it redirects it. The extent of the redirection varies from case to case.

For patent and copyright, these considerations make it possible to see that they can be species of property rights while yet exhibiting some monopolistic effects. The law is "realistic" with respect to information in that it generally does not make it the object of property rights: in principle, information flows freely. Where such rights exist, they are granted exceptionally and with consideration for what can be realistically enforced. Patent and copyright appear to be compromises between the incentive effects on the title holder and those that exclusion creates for competitors. The patchwork of rules known under the title of trade secret law may serve as an open category to protect information that is not the object of recognized property rights. The rules relating to trade secrets or confidential information have shown themselves to be such a "laboratory" in the case of the development of "horticultural property" in France (and presumably elsewhere).

These instruments allow citizens to experiment with the forms in which newly discovered values could be codified into

law. Driven by individuals seeking more utility, this process goes on continuously. It represents a "learning process" that may be applied to anything individuals consider to be valuable and marketable. Far from creating dissonant elements, a legislator drawing on such a learning process may properly be said to fit new property rights into the pattern of abstract rules regulating society.