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Publication Date

1999-10-01

Peer reviewed

MUDDY RULES FOR CYBERSPACE*

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ABSTRACT

Digital communication media such as the Internet pose difficult challenges for traditional forms of intellectual property protection. Much recent scholarship and considerable governmental attention has been focused on adapting and expanding copyright to encompass digital works of authorship. These efforts have been justified on the grounds that clear property rights are necessary to allow efficient allocation of intellectual property between private parties.

However, these rationales ignore the literature regarding the efficiency of unclear or “muddy” property entitlements. Where transaction costs of private bargaining are high, muddy rules will tend to force parties into informal bargaining transactions. Transaction costs on the Internet may tend to be high because of the number of parties involved, the difficulty of locating the parties, and the transborder nature of the medium. Thus, informal transactions or “self-help” may be the most efficient means for provision of digital works. In such a case, muddy or unclear rules should perhaps be favored for on-line entitlements.

INTRODUCTION

Digital communications media challenge our established notions of boundary.¹ In the relatively short time since the Internet exploded into public consciousness, no aspect of this medium has so captured the attention of courts and commentators

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¹ See ETHAN KATSH, *LAW IN A DIGITAL WORLD* 218-19 (1995).

as its capacity to erode barriers. Considerable commentary has focused upon the manner in which the Internet appears to bypass traditional political borders;² other commentary has focused upon how the network sidesteps traditional constraints on free trade³ and free speech.⁴ Other commentators have observed that the characteristics of digital media afford new opportunities to design technological boundaries, and so new ways to control behavior, information, and communication.⁵

As it challenges other notions of boundary, the Internet similarly challenges the boundaries demarcating rights in property, or at least the boundaries previously set for intellectual property. Consider, for example, the recent furor over control of intermediate copying in computer memory.⁶ Computers, especially networked computers, replicate digitized content as they perform operations on it.⁷ Each time an e-mail message is sent, or

² See, e.g., Keith Aoki, *(Intellectual) Property and Sovereignty: Notes Toward A Cultural Geography of Authorship*, 48 STAN. L. REV. 1293 (1996); Dan L. Burk, *Patents in Cyberspace: Territoriality and Infringement on Global Computer Networks*, 68 TUL. L. REV. 1 (1993); A. Michael Froomkin, *The Internet as a Source of Regulatory Arbitrage*, in BORDERS IN CYBERSPACE: INFORMATION POLICY AND THE GLOBAL INFORMATION INFRASTRUCTURE 129 (B. Kahin & C. Nesson eds., 1997); David R. Johnson & David Post, *Law & Borders—The Rise of Law in Cyberspace*, 48 STAN. L. REV. 1367 (1996); Joel R. Reidenberg, *Governing Networks and Rule-Making in Cyberspace*, 45 EMORY L.J. 911 (1996).

³ See Dan L. Burk, *Virtual Exit in the Global Information Economy*, 73 CHI.-KENT L. REV. 143 (1998); Walter A. Effross, *The Legal Architecture of Virtual Stores: World Wide Web Sites and the Uniform Commercial Code*, 34 SAN DIEGO L. REV. 1263, 1381-98 (1997); A. Michael Froomkin, *Flood Control on the Information Ocean: Living with Anonymity, Digital Cash, and Distributed Databases*, 15 J.L. & COM. 395, 449-79 (1996).

⁴ See David J. Goldstone, *The Public Forum Doctrine in the Age of the Information Superhighway (Where are the Public Forums on the Information Superhighway?)*, 46 HASTINGS L.J. 335 (1995); Ethan Katsh, *Rights, Camera, Action: Cyberspatial Settings and the First Amendment*, 104 YALE L.J. 1681 (1995); Eugene Volokh, *Cheap Speech and What it Will Do*, 104 YALE L.J. 1805 (1995); see also M. Ethan Katsh, *Software Worlds and the First Amendment: Virtual Doorkeepers in Cyberspace*, 1996 U. CHI. LEGAL F. 335, 347 [hereinafter Katsh, *Software Worlds*] (“The power of the government to obstruct expression . . . is reduced as national boundaries become increasingly irrelevant as obstacles to expression.”)

⁵ See Julie Cohen, *Some Reflections on Copyright Management Systems and Laws Designed to Protect Them*, 12 BERKELEY TECH. L.J. 161 (1997); Katsh, *Software Worlds*, *supra* note 4; Lawrence Lessig, *Reading the Constitution in Cyberspace*, 45 EMORY L.J. 869 (1996); Joel R. Reidenberg, *Lex Informatica: The Formulation of Information Policy Rules Through Technology*, 76 TEX. L. REV. 553 (1998); Jonathan Weinberg, *Rating the Net*, 19 HASTINGS COMM. & ENT. L.J. 453 (1997).

⁶ See generally I. Trotter Hardy, *Computer RAM “Copies”: Hit or Myth? Historical Perspectives on Caching as a Microcosm of Current Copyright Concerns*, 22 U. DAYTON L. REV. 423 (1997); Mark A. Lemley, *Dealing With Overlapping Copyrights on the Internet*, 22 U. DAYTON L. REV. 547 (1997).

⁷ See Hardy, *supra* note 6, at 426, 452; Lemley, *supra* note 6, at 552-53. See generally

a file downloaded, or a web page viewed, copies are made as the content is passed from machine to machine.⁸ Such replication is necessary to the functioning of the system: the copies are made automatically by the computers when executing routine operations. Such intermediate copying may not have been expressly authorized by the content owner, even though control over reproduction has long been instantiated as one of the exclusive rights of copyright owners.⁹ And yet, it is unclear whether any copyright infringement actually occurs, as the reproductions may be permissible under an implied permission to make the intermediate copies, or perhaps the copying is permissible under the copyright doctrine of “fair use.”¹⁰

Similarly, the increasing usage of the popular Internet application dubbed the “World Wide Web”¹¹ has generated boundary disputes over the hypertext linkage of web documents.¹² The web comprises a vast array of independently created computer files viewed as graphical displays.¹³ Authors of web documents may embed in their displays sets of “links”—that is, highlighted references that give the user’s computer the location of other computer files somewhere on the Internet. By using a mouse to point and click on the highlighted reference, a user of the World Wide Web can retrieve the referenced files, which may themselves contain further references, giving rise to a logical “web” of references.

However, the ability to refer users to a file may discomfit the owner of the file. An unwelcome competitor might offer the reference link, as has occurred in the case of rival newspapers in the United Kingdom;¹⁴ or the reference might cause the retrieval of files in an order not intended by the file owner.¹⁵ In such cases,

Andy Johnson-Laird, *The Anatomy of the Internet Meets the Body of the Law*, 22 U. DAYTON L. REV. 465, 469-74 (1997) (describing transmission of information on the Internet).

⁸ See Hardy, *supra* note 6, at 426, 452; Lemley, *supra* note 6, at 552-53.

⁹ See Lemley, *supra* note 6, at 552-53.

¹⁰ See *id.*

¹¹ See generally ED KROL & PAULA FERGUSON, *THE WHOLE INTERNET GUIDE FOR WINDOWS 95*, at 117-19 (1995) (describing the World Wide Web).

¹² See Maureen A. O’Rourke, *Fencing Cyberspace: Drawing Borders in a Virtual World*, 82 MINN. L. REV. 609, 611-12 (1998).

¹³ See KROL & FERGUSON, *supra* note 11, at 117, 123.

¹⁴ See James P. Connolly & Scott Cameron, *Fair Dealing in Webbed Links of Shetland Yarns*, 1998 J. INFO. L. & TECH. (June 30, 1998) <http://elj.warwick.ac.uk/jilt/copyright/98_2conn/> (analyzing web page controversy between the *Shetland Times* and the *Shetland News*).

¹⁵ See, e.g., *Ticketmaster Corp. v. Microsoft Corp.*, No 97-3055 DDP (C.D. Cal. filed

the file owner might attempt to use legal coercion, such as a copyright infringement suit, to deter the unwelcome linkages.¹⁶ Yet, as in the case of intermediate computer reproductions, it is far from clear that any copyright infringement has occurred, as the purveyor of the link has merely offered a reference to a file, rather than copying or distributing the file itself.¹⁷

Disputes like these result when there is uncertainty over which elements within the bundle of property rights have been granted to owners of digitized works.¹⁸ Files are replicated as they move about the Internet, yet it is unclear whether such replication can or should be controlled by the owner; hypertext links allow access to computer files, yet it is not clear whether such access can or should be controlled by the file owner. Digital media afford new uses for information or redefine old uses; but in either case, the novel use may not clearly fall within the currently defined boundaries of existing entitlements.

As shown in each of the examples above, copyright entitlements may be particularly susceptible to blurring by digital media technologies.¹⁹ This might seem no great cause for alarm, since copyright has never been a complete entitlement to every use of information within its purview; copyright has long been subject to a variety of compulsory licenses,²⁰ fair uses,²¹ and special interest exceptions.²² Still, owners of copyrighted works, fearing that

May 9, 1997); *Futuredontics Inc. v. Applied Anagramics, Inc.*, 45 U.S.P.Q.2d (BNA) 2005 (C.D. Cal. 1997).

¹⁶ There may also be trademark or unfair competition claims associated with such hypertext referencing. See Dan L. Burk, *Proprietary Rights in Hypertext Linkages*, 1998 J. INFO. L. & TECH. (June 30, 1998) <http://elj.warwick.ac.uk/jilt/intprop/98_2burk/>; Edward A. Cavazos & Coe F. Miles, *Copyright on the WWW: Linking and Liability*, 4 RICH. J.L. & TECH. 3, ¶¶ 60-71 (Winter 1997) <<http://www.richmond.edu/~jolt/v4i2/cavazos.html>>; Walter Effross, *Withdrawal of the Reference: Rights, Rules, and Remedies for Unwelcomed Web-Linking*, 49 S.C. L. REV. 651 (1998); O'Rourke, *supra* note 12, at 670-84.

¹⁷ See Burk, *supra* note 16 (analogizing hypertext links to footnote references in print documents); Cavazos & Miles, *supra* note 16; O'Rourke, *supra* note 12, at 653 (continuing hypertext/footnote analogy); Pamela Samuelson, *Fair Use for Computer Programs and Other Copyrightable Works in Digital Form: The Implications of Sony, Galoob, and Sega*, 1 J. INTEL. PROP. L. 49, 115 (1993) (same).

¹⁸ See O'Rourke, *supra* note 12, at 640-41.

¹⁹ The Internet has also generated many trademark-related controversies, where the difficulty relates to incomplete control of the reputational capital associated with the source of the digitized material, rather than control of the digitized material itself. See Dan L. Burk, *Trademark Doctrines for Global Electronic Commerce*, 49 S.C. L. REV. 695, 701-02 (1998).

²⁰ See 17 U.S.C. § 114 (1994).

²¹ See *id.* § 107.

²² See, e.g., *id.* § 110(6) (providing an exception for performance of a non-dramatic

digital media will foster additional inroads on their entitlements—and perhaps seeing an opportunity to capture new uses in digital media—have lobbied tirelessly in both domestic and international fora for protection and expansion of their ownership rights.²³

This protectionist agenda draws support from a recent wave of scholarly commentary arguing that intellectual property must be defined by “strong” property rights,²⁴ and that digital works in particular must be protected by such rights.²⁵ These analyses draw heavily on analogies to rights in real property, most particularly the economic analysis of rights in real property.²⁶ Yet, curiously,

musical work by a non-profit agricultural or horticultural organization at an annual fair or exhibition).

²³ See, e.g., INFORMATION INFRASTRUCTURE TASK FORCE, INTELLECTUAL PROPERTY AND THE NATIONAL INFORMATION INFRASTRUCTURE: THE REPORT OF THE WORKING GROUP ON INTELLECTUAL PROPERTY RIGHTS (1995). The Clinton administration has proposed domestic legislation based on the recommendations in this administration report. See H.R. 2441, 104th Cong. (1995); S. 1284, 104th Cong (1995). The principal author of the administration report, Bruce Lehman, has also pressed similar proposals at the international level. See Pamela Samuelson, *The U.S. Digital Agenda at WIPO*, 37 VA. J. INT’L L. 369 (1997) [hereinafter Samuelson, *The U.S. Digital Agenda at WIPO*] (detailing domestic and international campaign to secure protectionist copyright legislation). These maneuvers have been widely criticized as elevating the interests of content owners over the interests of content users and the public interest. See, e.g., Peter Jaszi, *Caught in the Net of Copyright*, 75 OR. L. REV. 299 (1996); Jessica Litman, *The Exclusive Right to Read*, 13 CARDOZO ARTS & ENT. L.J. 29 (1994); Charles R. McManis, *Taking TRIPS on the Information Superhighway: International Intellectual Property Protection and Emerging Computer Technology*, 41 VILL. L. REV. 207 (1996); Pamela Samuelson, *The Copyright Grab*, WIRED, Jan. 1996, at 134.

²⁴ See, e.g., Kenneth W. Dam, *Some Economic Considerations in the Intellectual Property Protection of Software*, 24 J. LEGAL STUD. 321 (1995); Frank H. Easterbrook, *Intellectual Property is Still Property*, 13 HARV. J.L. & PUB. POL’Y 108 (1990); Roger E. Meiners & Robert J. Staaf, *Patents, Copyrights, and Trademarks: Property or Monopoly?*, 13 HARV. J.L. & PUB. POL’Y 911 (1990); see also Carol M. Rose, *The Several Futures of Property: Of Cyberspace and Folk Tales, Emission Trades and Ecosystems*, 83 MINN. L. REV. 129, 130 (1998) (noting the trend toward private property solutions to social issues in cyberspace). The common ancestor of such scholarship is Harold Demsetz, *Toward A Theory of Property Rights*, 75 AM. ECON. REV. PAPERS & PROC. 347, 359 (1967) (arguing that copyright solves externality problems “closely analogous” to those which arise in land ownership).

²⁵ See, e.g., Frank Easterbrook, *Cyberspace and the Law of the Horse*, 1996 U. CHI. LEGAL F. 207, 210-14; I. Trotter Hardy, *Property (and Copyright) in Cyberspace*, 1996 U. CHI. LEGAL F. 217 [hereinafter Hardy, *Property (and Copyright) in Cyberspace*]; see also I. Trotter Hardy, *The Ancient Doctrine of Trespass to Web Sites*, 1996 J. ONLINE L. art. 7 (October 1996) <<http://www.wm.edu/law/publications/jol/hardy.html>> [hereinafter Hardy, *The Ancient Doctrine*] (arguing that where copyright does not afford full control to a web site owner, trespass to land doctrines should be applied).

²⁶ See, e.g., Hardy, *The Ancient Doctrine*, *supra* note 25; see also Rose, *supra* note 24, at 136 (noting that “land is the central metaphor for property itself”). However, analogies between the Internet and real property have not been confined to the area of intellectual property. See, e.g., *Cyber Promotions, Inc. v. America Online*, 948 F. Supp. 436 (E.D. Pa. 1996) (rejecting bulk e-mail service’s argument that Internet access provider’s service was

none of these strong property analyses deals seriously with studies addressing the legitimate role of other kinds of entitlements in real property, such as the literature on the role of unclear, or “muddy,” entitlements.²⁷ The structure of entitlements in real property is not, and never has been, characterized by packets of complete and well-defined rights;²⁸ real property entails not simply a clear right to exclude, as in the case of trespass, but a host of less determinate rights under the law of easements, takings, nuisance, possessory interests, adverse possession, and the like.

The proponents of strong property entitlements might view this parade of exceptions as inefficient deviations from their preferred model. Yet there exists a robust literature analyzing the law and economics of such partial entitlements, suggesting the conditions under which they may be more appropriate than determinate entitlements. Thus, Richard Epstein reminds us that property rules may at times be most efficient when borders are fuzzy—as, for example, when a commonly owned strip of land is needed between two fields in order for farmers to turn their plows.²⁹ One cannot help but wonder if there may not be analogous situations in cyberspace where efficiency would be better served by a fuzzy border.

This Article is intended to at least partially address this question, by suggesting a role for “muddy” rules in cyberspace. It begins with a brief recitation of the case for strong property rights in informational works, highlighting certain difficulties with the case as promulgated by its advocates. It then offers several critiques that suggest an important role for “muddy” entitlements in the law of intellectual property, and which challenge “clear” entitlements as necessarily the optimal rule for intellectual property. The analysis then turns to a discussion of the Internet, showing that its idiosyncrasies render the “strong” property argument even more suspect in cyberspace than in real space. Finally, the Article offers reasons why “muddy” entitlements may be beneficial in fostering informational works in the on-line world, and concludes that a full range of entitlement structures, and not

analogous to a “company town” for purposes of First Amendment forum analysis).

²⁷ See, e.g., Thomas Merrill, *Trespass, Nuisance, and the Costs of Determining Property Rights*, 14 J. LEGAL STUD. 13 (1985); Carol M. Rose, *Crystals and Mud in Property Law*, 40 STAN. L. REV. 577 (1988).

²⁸ See Merrill, *supra* note 27, at 13.

²⁹ See Richard Epstein, *Transaction Costs and Property Rights: Or, Do Good Fences Make Good Neighbors?*, at 6-7 (Chicago Working Papers in Law and Economics, 2d Series) (March 1996).

merely strong property rights, will be as appropriate to cyberspace as it has been to real space.

I. NOMENCLATURE

In order to discuss the structure of entitlements for intellectual property in digital networks, it may be helpful at the outset to distinguish among the sets of nomenclature for designating such entitlements. Each of these related but conceptually distinct sets of nomenclature has generated its own extensive body of commentary in the legal literature. These respective bodies of commentary address different aspects of legal entitlements under the titles of “property rules and liability rules,” “divided and complete entitlements,” and, last but not least, “muddy and clear rules.” Each of these sets of nomenclature appears to describe a dimension of what is meant by proponents of “strong” property when they compare cyberspace to real property entitlements.

A. *Defining Property*

Much of the “strong” property literature draws explicitly upon the nomenclature of “property rules” and “liability rules” articulated by Calabresi and Melamed in their famous framework of rights and responsibilities.³⁰ The two types of rules are primarily differentiated by the ability of the property owner, under a property rule, to exclude others from use of the property.³¹ Under a liability rule, the owner cannot exclude others from taking or using the property, but he can demand compensation or damages.³² In many senses, it is the decisional authority that distinguishes the two systems: under property rules, the owner makes the decision to exclude or not; under liability rules, the option to take or not rests with outside parties. Depending on the circumstances, decisional authority may even oscillate between the two regimes. For example, under normal circumstances, a boat owner must have permission to tie up to a dock. However, in a storm he may be permitted to tie up without permission, so long as he pays for any damage caused.³³ The exigency of the storm, and obstacles to formal bargaining change the dock owner’s entitlement from a

³⁰ See Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089 (1972).

³¹ See *id.* at 1105.

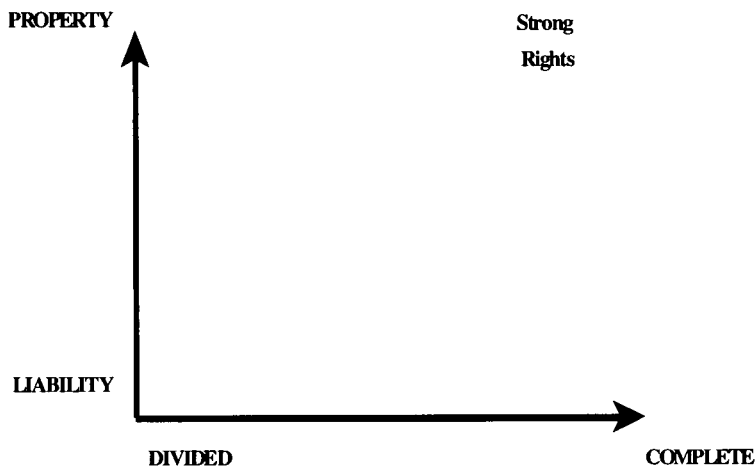
³² See *id.* at 1105-06.

³³ See, e.g., *Vincent v. Lake Erie Transp. Co.*, 124 N.W. 221 (Minn. 1910).

property rule to a liability rule.

This distinction between property rules and liability rules is not the same as the distinction between complete and divided entitlements,³⁴ although the two matters have, of late, been discussed together with some frequency.³⁵ Divided entitlements appear whenever more than one entity has a claim to the property; that is, where the property owner must share or cede some uses of the property under certain circumstances.³⁶ This divided entitlement might be either a property rule or a liability rule, or it may toggle between the two. The essential question for a divided entitlement is not so much “Can the owner exclude or merely demand a royalty?” but rather “When can the owner exclude or demand a royalty?”

These different aspects of entitlements appear in varying degrees, and in different combinations, in various regimes of ownership. We might imagine plotting a graph of entitlements, on which the vertical axis represents degrees of “propertyness” and



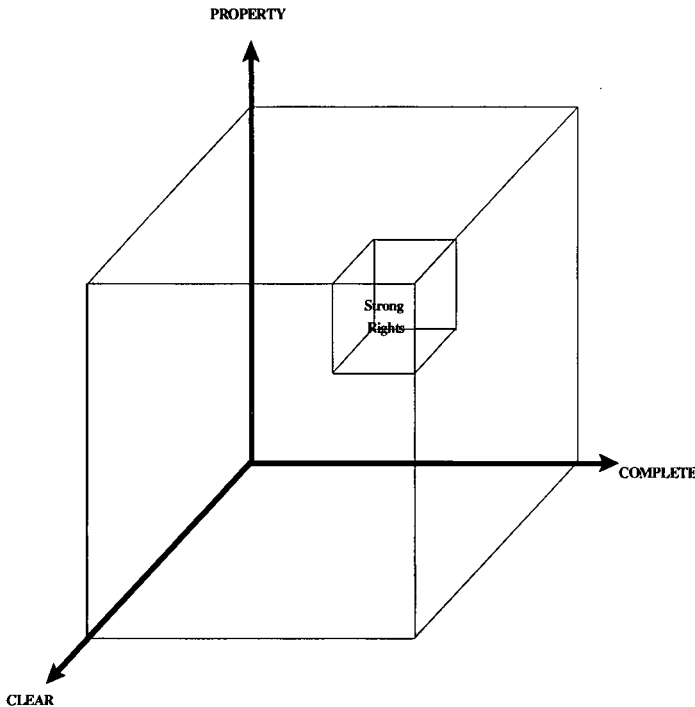
“liabilityness” of different entitlement rules. The origin point would represent a pure liability rule, and some point distant from

³⁴ See A. Mitchell Polinsky, *Resolving Nuisance Disputes: The Simple Economics of Injunctive and Damage Remedies*, 32 STAN. L. REV. 1075, 1087 (1980).

³⁵ See Ian Ayres & Eric Talley, *Solomonic Bargaining: Dividing a Legal Entitlement to Facilitate Coasean Trade*, 104 YALE L.J. 1027 (1995); Louis Kaplow & Steven Shavell, *Property Rules Versus Liability Rules: An Economic Analysis*, 109 HARV. L. REV. 713 (1996).

³⁶ See Ayres & Talley, *supra* note 35 (noting that the line between divided entitlements and separate entitlements can be blurry).

the origin would represent a pure property rule. The horizontal axis of the same graph would represent degrees of “dividedness” and “completeness” of entitlements. Again, the origin would represent a completely divided—or perhaps a better word might be fragmented—entitlement rule, and some distant point on the horizontal axis would represent a wholly complete entitlement rule. On such a graph, points in the far upper corner, diagonal from the origin, would represent strong property rights: those that are both exclusive and complete.



But the potential universe of entitlements described by this two-dimensional graph does not encompass the nomenclature of “clear” and “muddy” entitlements, a dimension distinct from the entitlement parameters described so far.³⁷ There must be a third axis on the graph, turning it into a three-dimensional coordinate system. This third dimension has reference to the rules demarcating the extent of an entitlement; the demarcation is said to be “clear” if

³⁷ See Rose, *supra* note 27 (describing “clear” and “muddy” entitlements).

the outcome of an entitlement dispute is predictable.³⁸ If the outcome is not predictable, the rule is said to be “muddy.” These terms are closely related to the rubric of “rules,” under which the entitlement is determined *ex ante*, and “standards,” under which the entitlement is determined *ex post*.³⁹ The distinction between “muddy” legal rules and legal standards tends to lie in the analytical focus on their effects: legal standards are discussed in terms of the flexibility that they accord a decisionmaker, whereas muddy rules are discussed in terms of the effect of their indeterminacy on parties to potential trade. Both standards and muddy entitlements tend to be subject to more complex legal tests that give the decisionmaker greater flexibility in determining the outcome.⁴⁰ This is not to say that a complex rule is necessarily a “muddy” rule; some very complex rules may yield clear outcomes⁴¹—thus, even the infamous Rule Against Perpetuities, which no competent lawyer can be expected to remember properly,⁴² yields results as predictable as clockwork when applied correctly.⁴³ Rather, the hallmark of a “muddy” entitlement is its *ex ante* indeterminacy—typically, a muddy rule will involve some type of legal “balancing” test, where a court or decisionmaker weighs a variety of competing factors before coming to a determination of entitlements in the property.⁴⁴

Thus, the third axis on the entitlement graph would depict the range of entitlement rules from wholly indeterminate, or “muddy,” rules at the origin to completely predictable, or “crystal clear,” rules at some far-flung point. The axes of the graph now define a three-dimensional coordinate system in which the origin still represents the “weakest” of entitlements: a muddy, divided, liability rule. The region of “strong” rights has now moved to an area in space diagonally opposite the origin, where clear, complete, exclusionary property is the rule. This region appears to be the focus of advocates of “strong” property in cyberspace:

³⁸ See *id.*; see also Merrill, *supra* note 27, at 24 (discussing “mechanical” and “judgmental” rules).

³⁹ See Louis Kaplow, *Rules Versus Standards: An Economic Analysis*, 42 DUKE L.J. 557 (1992); Pierre Schlag, *Rules and Standards*, 33 UCLA L. REV. 379 (1985).

⁴⁰ See Merrill, *supra* note 27, at 23.

⁴¹ See *id.* at 23 n.43.

⁴² See *Lucas v. Hamm*, 364 P.2d 685 (Cal. 1961), *cert. denied*, 368 U.S. 987 (1962) (holding that lawyer’s failure to correctly apply the Rule Against Perpetuities was not malpractice, because the rule is difficult to understand).

⁴³ The Rule has in fact been reduced to a computer algorithm. See John P. Finan & Albert H. Leyerle, *The Perp Rule Program: Computerizing the Rule Against Perpetuities*, 28 JURIMETRICS J. 317 (1988).

⁴⁴ See Merrill, *supra* note 27, at 23.

undivided, bright-line property rules.

However, the graph clearly demonstrates the diversity of possible entitlement regimes that can and do exist in the law of property. The "entitlement space" defined by the three axes illustrates first that entitlements are not binary along any of the three axes; there can be differing degrees of "propertyness," "liabilityness," "dividedness," and "clarity." Additionally, entitlements can comprise any combination of property/liability, divided/complete, and muddy/clear rules. Once these parameters are understood, certain regions of the entitlement space take on a familiar aspect, encompassing sets of ownership rules from well-known areas of law. For example, common law concurrent estates in land, such as joint tenancy,⁴⁵ tenancy in common,⁴⁶ or tenancy by the entirety,⁴⁷ lie in the region comprising clear, but divided, property rules. Under the classic formulation, joint tenancy arises when the tenants obtained their identical undivided interests at the same time, under the same instrument, yielding concurrent entitlements with survivorship interest⁴⁸—a hard-edged property entitlement rule, but one yielding a divided interest. It is worth noting that the "completeness" dimension of our entitlement space is not necessarily limited to concurrent divisions of interests; the law of contingent remainders offers an example of a clear, divided property entitlement, but one in which the entitlement is divided in time rather than in space.⁴⁹ The entitlement can be divided, per Robert Ellickson's analysis of land divisions, by space, use, or time.⁵⁰

Liability rules may also be clear and divided, as illustrated by the classic compulsory licenses in intellectual property: in copyright, for making and distributing "covers" of sound recordings;⁵¹ and in patent, for inventions related to civilian use of fissile material.⁵² In each case, individuals other than the property owner are absolutely entitled to use of the property so long as they

⁴⁵ See generally R. CUNNINGHAM ET AL., *THE LAW OF PROPERTY* § 5.3. (1993).

⁴⁶ See generally *id.* § 5.2

⁴⁷ See *id.* § 5.5.

⁴⁸ See *id.* § 5.2.

⁴⁹ Under the law of contingent future interests, estates in land may be devised to a party or parties contingent upon some event, the occurrence of which would transfer the interest to a new party. See generally *id.* § 3.1.

⁵⁰ See Robert Ellickson, *Property in Land*, 102 *YALE L. J.* 1315, 1363 (1993).

⁵¹ See 17 U.S.C. § 115 (1994).

⁵² See 42 U.S.C. § 2183 (1994). See generally Bennett Boskey, *Inventions and the Atom*, 32 *J. PAT. OFF. SOC'Y* 563 (1950) (discussing the various patent provisions of the Atomic Energy Act).

pay a licensing fee set not by the owner, but by a government entity.⁵³ Divided liability rules may also be muddy, as in the case of easements implied from necessity.⁵⁴ Such easements are, in essence, the entitlement to use some part of a neighbor's property at a royalty of zero, when "necessary" for access to make "effective use" of land—the definition of what is "necessary" and "effective" being, of course, rather unclear.

Having distinguished between these three sets of nomenclature, we must acknowledge that they are nonetheless related in many instances; in other words, the exact shape of our "entitlement space" may be distorted by overlapping sets of coordinate points. For example, the liability dimension may not always be clearly distinguished from the "dividedness" dimension—a liability rule might, under certain circumstances, be considered a type of divided property right, as an outside party can exercise an "option" to use the property, subject to a fee.⁵⁵ Similarly, a divided entitlement might well be created or approximated by a muddy standard—because the entitlement is muddy, the parties to a disputed property right will be uncertain as to the extent of their rights.⁵⁶ This causes the parties to view the entitlement in a probabilistic manner, which itself constitutes a type of divided property entitlement. In such instances, the property nomenclature described by the three dimensions of the graph may be conceptually distinct, but practically equivalent.

B. *Justifying "Strong" Property*

The entitlement graph generated above illustrates the diversity of entitlements in the law of property, and the particular relationship of rules advocated by those who declare that "intellectual property is still property." Such commentators advocate "strong" entitlements comprising clear and undivided Calabresi/Melamed property rules. In the case of real property, such rules are advocated as a means to internalize the value of the

⁵³ In the case of copyrighted sound recordings, the compulsory licensing fee is set either by voluntary negotiation or by a copyright arbitration royalty panel. See 17 U.S.C. § 115(c)(3)(C), (D) (1994). For patents relating to civilian nuclear power, the compulsory licensing fee is set by the Nuclear Regulatory Commission. See 42 U.S.C. § 2183 (1994); see also S. REP. NO. 1211 (1946), reprinted in 1946 U.S.C.C.A.N. 1327, 1335 (compulsory license for civilian nuclear energy inventions intended to promote private sector development of nuclear energy).

⁵⁴ See generally CUNNINGHAM ET AL., *supra* note 45, § 8.5.

⁵⁵ See Ayres & Talley, *supra* note 35, at 1041.

⁵⁶ See Jason Scott Johnston, *Bargaining Under Rules Versus Standards*, 11 J.L. ECON. & ORG. 256 (1995).

property in order to conserve and maximize the value of existing scarce resources.⁵⁷ Yet, as Richard Epstein points out, in the case of intellectual property this justification goes too far: “No matter how hard one labors, you cannot ‘copy’ the crops.”⁵⁸

Consequently, what can be said to justify the adoption of such rules for intangible property? The tale most often told to justify the creation of intellectual property rights is the now-familiar public goods story: informational works resemble public goods in that they are non-rival—that is, they can be simultaneously used or consumed by more than one person without interference. The easy reproducibility of such informational works mimics the second feature of public goods—non-exclusivity.⁵⁹ It is very difficult to exclude people from consuming either public goods or informational goods. Consequently, since the marginal cost of reproducing and distributing such works is extremely low, there will be little incentive to create the works if they are sold at a price near the marginal cost.⁶⁰ Legal fences, in the form of exclusive rights, allow the creators of these works to exclude free-riding patrons of the works, and extract payment for access to the works. The ability to extract payment offers an incentive that encourages the creation and dissemination of such works.⁶¹

Although this story offers a plausible rationale for the creation of intellectual property rights, it makes a poor argument, by itself, for strong property rights because it implies an efficiency trade-off. As the recipient of the intellectual property right raises the price of the work beyond the marginal cost near zero, people who would have chosen to purchase or obtain the work at the lower price can no longer afford it. Thus, the incentive to create the work is purchased at the expense of restricted availability.⁶² That restricted availability represents a loss of social welfare. The loss is acceptable up to the point required to induce creation of the work, but not beyond. It is by no means clear that a property right which appropriates all the value of the work to the creator is necessary to induce creation of the work; presumably, the creator

⁵⁷ See Epstein, *supra* note 29.

⁵⁸ *Id.*

⁵⁹ See Paul A. Samuelson, *The Pure Theory of Public Expenditures*, 36 REV. ECON. & STAT. 387 (1954).

⁶⁰ See William M. Landes & Richard Posner, *An Economic Analysis of Copyright Law*, 18 J. LEGAL STUD. 325, 326 (1989).

⁶¹ See *id.*

⁶² See ARMEN ALCHIAN & WILLIAM R. ALLEN, *EXCHANGE & PRODUCTION: COMPETITION, COORDINATION & CONTROL* 100 (3d ed. 1983).

would be prompted to create if he received a right that ensured he could at least cover his costs.⁶³

Consequently, advocates of strong property rights must tell some different story to justify the welfare loss from increasing the cost of the work beyond what is necessary to prompt its creation.⁶⁴ One alternative is the “revealed preference” story. Under this theory, intellectual property rights are necessary not merely to encourage creation of creative works, but to determine what level of investment and production is desirable in such works.⁶⁵ Buyers’ willingness to pay acts as a signal to producers, telling them what quantity of the good society desires, and what level of resources should be devoted to producing it.

A major difficulty with this rationale is, of course, that the signal as to the correct level of production is skewed from the outset by the nature of the goods in question. For tangible, rival, excludable goods, pricing at marginal cost places the price of the goods within reach of the largest feasible number of buyers and sets the correct level of output.⁶⁶ This is not so for intellectual goods, where pricing at marginal cost means pricing at zero or close to zero. Legal rights to exclude allow the producer to price above marginal cost, but pricing above marginal cost excludes a number—perhaps a large number—of buyers who would otherwise purchase or acquire the good. Consequently, the true dimensions of the potential market for the good are obscured, and we cannot get a correct picture of consumer preference for the good after all.⁶⁷

A third version of the story therefore becomes necessary to justify strong property in informational goods. This third story might be termed the “coordination” story. Under this rationale,

⁶³ Like any other business, authors would be expected to produce “output”—that is, creative works—if their revenue equaled their minimum average variable costs. See generally ROBERT S. PINDYCK & DANIEL L. RUBINFELD, MICROECONOMICS 251-52 (2d ed. 1992). The author may even incur short-term losses if she has an expectancy of long-term returns. See *id.* However, it should be borne in mind that if the market is competitive, economic profits, which include a reasonable return on investment, will tend toward zero. See *id.* at 265.

⁶⁴ See, e.g., Robert P. Merges, *Are You Making Fun of Me?: Notes on Market Failure and the Parody Defense in Copyright*, 21 AIPLA Q.J. 305, 306 (1993) [hereinafter Merges, *Are You Making Fun of Me?*] (arguing that a “crude” incentive story is inadequate to justify intellectual property rights); Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 842 (1990) (same).

⁶⁵ See Merges, *Are You Making Fun of Me?*, *supra* note 64, at 306.

⁶⁶ See ALCHIAN & ALLEN, *supra* note 62, at 208-09.

⁶⁷ See Edmund W. Kitch, *Patents: Monopolies or Property Rights?*, 8 RES. L. & ECON. 31.

complete control over the information good must be given to the producer in order for her to manage efficient use of the resource.⁶⁸ If control of the good is incomplete or held in common, conflicting uses might arise. Of course, non-rival goods cannot, by definition, be congestible in the same way that rival goods are—use of a non-rival good does not interfere with another's access to the same good. So yet another story must be told about the “conflicting uses” of informational goods than is told about those physical goods. Here the conflicting uses become the unwillingness of buyers to invest in a good that might also be developed by someone else. Giving the producer full control enables her to raise the price of the good and locate the buyer who values it the most—that is, the buyer who is willing to pay the most for the exclusive right to develop the informational good.⁶⁹ So, on this theory, strong property rights in intangibles should be granted for the same reason that they are granted in homesteads and other claims to land: to coordinate the development of the resource by putting it in the hands of a private owner.⁷⁰ This is sometimes called the “prospect” theory, as it gives creators a “claim” or “stake” in intellectual property, much the way nineteenth century American prospectors or homesteaders were given a claim or stake in open lands.

The trouble with this story is that, for intellectual property, it brings us full circle—it is simply the first story once removed, where an exclusive right is needed to induce the buyer to buy, rather than to induce the producer to produce. Once again, a welfare trade-off occurs between the highest value developer, who is induced by exclusivity to develop the work, and the other developers, who, in theory, could simultaneously hold and use the work. It is this need to give the entitlement to the developer with the highest willingness to pay that suggests there is little room in this tale for “muddy” entitlements—if full control is to be given to the developer to coordinate the use of the informational work,

⁶⁸ See Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265 (1977); see also Wendy J. Gordon, *Asymmetric Market Failure and Prisoner's Dilemma in Intellectual Property*, 17 U. DAYTON L. REV. 853, 855-56 n.13 (1992) (applying “coordination” rationale to copyright). Robert Denicola has also made a similar argument in the context of trademarks, which, as signals rather than discrete goods, are not generally included in the “incentive” rationale of patent and copyright. See Robert Denicola, *Institutional Publicity Rights: An Analysis of the Merchandising of Famous Trade Symbols*, 62 N.C. L. REV. 603, 637-41 (1984).

⁶⁹ See Kitch, *supra* note 68, at 276.

⁷⁰ See *id.* at 275-76; see also Harold Demsetz, *The Private Production of Public Goods*, 13 J.L. & ECON. 293, 295-96 (1970).

then an unclear or uncertain title will hamper that outcome. Yet, as we shall see shortly, not only are “muddy” entitlements encompassed by copyright, but they play a vital role in fostering creativity.

II. MUDDY RULES FOR COPYRIGHT

The rationale for “strong” property rules in copyright—particularly the “coordination” rationale—is based upon analogies to the law of real property. Yet, as the entitlement graph above demonstrates, the law of real property is not at present, nor has it ever been, subject to an exclusive regime of strong, undivided, Calabresi/Melamed property entitlements. Rather, it encompasses a variety of entitlement regimes. Thus, the analogy to real property may tell more than its advocates first intended, as there exists a robust literature analyzing the differing transactional environments under which various entitlements may be most appropriate. Nearly all these kinds of entitlements—property rules, liability rules, divided claims, “muddy” standards, and so on—can be found in some form within the United States’ federal copyright system. This suggests that such a variety of entitlements may be appropriate in the law of copyright for many of the same reasons that it is appropriate in the law of real property: to deal with differing transactional environments.

A. *Copyright Mud*

Among the muddiest of entitlement rules in the law of copyright is the doctrine of originality, which seeks to separate material that originates with an author from that which does not.⁷¹ In describing the vagaries of this doctrine, Jessica Litman relates a parable concerning ownership of a cherry tree.⁷² As the story goes, this tree stood between two adjoining pieces of land which had purportedly been surveyed and the boundaries of each recorded in the appropriate governmental office.⁷³ When a dispute arose regarding the ownership of the tree, the two claimants expected that the matter would be resolved by an appeal to the recorded survey. Instead, to their astonishment, they learned that no survey had been recorded, but that a court would instead award ownership on the basis of some entirely different criteria,

⁷¹ See generally 3 MELVILLE B. & DAVID NIMMER, NIMMER ON COPYRIGHT § 12.01 (1998).

⁷² See Jessica Litman, *The Public Domain*, 39 EMORY L.J. 965, 1006-07 (1990).

⁷³ See *id.* at 1007.

apparently unrelated to boundary lines, such as which claimant was able to bake the best cherry pie.⁷⁴

Litman uses the parable of the cherry tree first, to remind us that the legal borders supposedly designated by the copyright doctrine of originality are in fact nebulous and inchoate; second, to observe that courts relying upon originality seem to reach decisions on grounds as unrelated to originality as a deed is unrelated to a pie baking contest; and third, to suggest that if such results obtained in the world of real property, we would be far more disturbed than we seem to be about the same results in the world of intellectual property.⁷⁵ Yet the astonishing truth is that in the context of real property, we find allocation of ownership by courts perhaps not on the basis of pie baking, but upon rules apparently just as chimerical. The boundaries of land may appear to be clearly demarcated and an owner's right to exclude others from its use absolute—such a right to exclude is purportedly the essence of a property right.⁷⁶ However, if property is invaded by a neighbor's loud noises, drifting smoke, noxious odors, or shining light, the owner may have no recourse unless he can prove that the neighbor's activity is "unreasonable" under the law of nuisance—that is, that the value of the disturbing activity is outweighed by the harm it is causing.⁷⁷ Thus, where a nuisance is concerned, the landowner's entitlement is not clear or an absolute right; it is, rather, subject to a muddy and indeterminate judicial balancing test that has little to do with the legal boundaries of the deed.

The decisional rule in Litman's parable is not entirely without sense. For example, it may be rational to ignore the boundaries of the landowners' deeds and consider some other criterion if the goal is to award use of the cherry tree to an owner who can make what society considers the best use of its fruit—in this case, by making it into award-winning pies. Similarly, the emergence of unclear nuisance laws in real property is believed to be a response to allocation problems in situations where costs for transacting entitlement bargains are prohibitively high.⁷⁸ Where transaction costs are low, real property rules such as trespass give the property holder a clear right to exclude, which facilitates bargaining for the

⁷⁴ See *id.*

⁷⁵ See *id.*

⁷⁶ See, e.g., *Olwell v. Nye & Nissen Co.*, 173 P.2d 652, 654 (Wash. 1946) ("The very essence of the nature of property is the right to its exclusive use.").

⁷⁷ See, e.g., RESTATEMENT (SECOND) OF TORTS § 826 (1965) (describing balancing test for legal nuisance).

⁷⁸ See Merrill, *supra* note 27.

right. But where transaction costs are high, such bargaining will not occur in any event, and the clear right simply reinforces the impasse: the party placing a higher value on the right is blocked from bargaining for it and will unquestionably be penalized for taking it without bargaining.⁷⁹ Thus, the property remains with the initial rights holder, even though others place a higher value on it. Development of an unclear or “muddy” rule helps break the impasse by moving the dispute to court for a third party review of the entitlement. In the particular case of nuisance, the court can review the relative social value of the intrusion, which might simply have been blocked under a clear property rule, no matter how socially valuable.

Alternatively, a muddy rule may help break the high transactions cost impasse by encouraging the parties to develop less costly alternatives to formal bargains.⁸⁰ Lemley and McGowan offer a prime example of such informal bargaining in the software industry: developers of software, particularly computer operating systems, may declare their software to be “open”—that is, amenable to the development of compatible software products.⁸¹ A software developer may signal the earnestness of such a declaration by publishing the code to his program, thus allowing other programmers access to the code in developing compatible products.⁸² Both developers are likely to benefit from this arrangement, as the operating system is more attractive to consumers when a large number of compatible applications is available, and applications are more attractive when they work with a known operating system.⁸³ However, in this instance, no formal development contract or terms are negotiated, and both

⁷⁹ For this reason, commentators have suggested that liability rules may be preferable in some high transaction cost situations, as the party placing the higher value on the property can simply take it, so long as he is willing to compensate the owner for his loss—which he will presumably be willing to do if he values the property more than the owner. See Calabresi & Melamed, *supra* note 30. *But see* Polinsky, *supra* note 34 (showing that under imperfect market conditions, neither property nor liability regimes are necessarily preferable).

⁸⁰ See Joel Trachtman, *Externalities and Extraterritoriality: The Law and Economics of Prescriptive Jurisdiction*, in *COMPARATIVE ASPECTS OF INTERNATIONAL LAW* 642 (Alan Sykes & Jagdeep Bhandari, eds., 1997); cf. James E. Krier & Stewart J. Schwab, *Property Rules and Liability Rules: The Cathedral in Another Light*, 70 N.Y.U. L. REV. 440, 446 (1995) (arguing that judicial refusal to intervene when market negotiations fail will prompt parties to reduce transactions costs).

⁸¹ See Mark A. Lemley & David McGowan, *Legal Implications of Network Economic Effects*, 86 CAL. L. REV. 479, 493-94 (1998).

⁸² See *id.*

⁸³ See *id.*

parties are saved the transaction costs of locating potential partners and bargaining with them.⁸⁴

Muddy entitlements are well-suited to fostering solutions to the high transaction cost problem; because the ownership of the right is unclear, claimants are forced to deal with one another. Tying parties together in the context of an unclear entitlement might initially seem unwise, perhaps causing a serious impediment to exchange, such as bilateral monopoly. The classic bilateral monopoly in real property is perhaps best illustrated by the situation in *Edwards v. Lee's Administrator*,⁸⁵ where Edwards owned land including the entrance to a cave, but much of the cave lay under the property of Lee, and so belonged to him under Kentucky property law.⁸⁶ The cave belonging to Lee had value as a tourist attraction, but was accessible only through Edwards's entrance; at the same time, Edwards's entrance was of little worth without showing Lee's portion of the cave. A situation of this sort creates exceptionally high transaction costs due to each party's incentive to behave strategically and "hold out" for the full value of the entitlement.⁸⁷

Recall, however, that muddy rules create probabilistic entitlement divisions—the parties are tied together, but neither is certain of the extent of his claim. If either engages in strategic behavior and pushes his luck too far, there is a possibility that the other may choose to seek judicial clarification of the entitlement and could be awarded the entire entitlement.⁸⁸ Indeed, the uncertainty itself makes litigation potentially expensive, and so there are incentives to find some other method of clarification. This is not the situation in which property owners such as Edwards and Lee find themselves—rather, they have two complete entitlements, the values of which are interdependent.

⁸⁴ Note that although this arrangement does not fit the formal legal definition of even an implied-in-fact contract, it does fit the broader economic definition of contract as "an arrangement between two or more actors supported by reciprocal expectations and behavior." Jeffrey N. Gordon, *The Mandatory Structure of Corporate Law*, 89 COLUM. L. REV. 1549 (1989). There also is likely to be a significant legal dispute if the developer that offered his system for interoperability later attempts to renege. See, e.g., *Wang Lab., Inc. v. Mitsubishi Elecs., Inc.*, 103 F.3d 1571 (Fed. Cir. 1997) (finding that software owner that encouraged other companies to adopt patented software was estopped from later enforcing patent against companies who relied on such encouragement).

⁸⁵ 96 S.W.2d 1028 (Ky. 1936).

⁸⁶ See *id.*

⁸⁷ See *id.* In *Edwards*, the court awarded restitution by apportioning pro rata profits according to the linear feet of cave belonging to the respective parties.

⁸⁸ See Johnston, *supra* note 56.

Copyright doctrines such as fair use appear to operate as muddy entitlements.⁸⁹ Fair use permits unauthorized use of copyrighted work in situations where there is a high social value to the use.⁹⁰ It is essentially impossible to determine in advance of litigation whether a particular unauthorized use is fair; the copyright statute instructs courts to consider several factors in determining fair use, including the extent of the taking, the type of work involved, the use made, and the effect on the market for the work⁹¹—a classic “muddy” balancing test. The type of takings contemplated in fair use has been identified as those in which the transaction costs associated with negotiating the use of a copyrighted work would tend either to exceed the value of the taking or to frustrate takings of high social value.⁹² Thus, copyright fair use appears to be employed in situations of high transaction costs, where a muddy entitlement may be appropriate. Because the allocation of entitlements under fair use is ambiguous, the standard will sometimes channel creators and users into court to determine ownership. The “muddy” four-part balancing standard of fair use allows courts to reallocate what the market cannot.⁹³ More often, the uncertainty created by the muddy standard tends to channel buyers and sellers into less costly informal structures. In the case of fair use, this may primarily take the form of a “truce” between owners and users when the taking stays below a certain threshold.⁹⁴ In cases where the taking is more substantial, repeated, or valuable, litigation will occur.

Much the same story might be told about copyright originality, the ownership doctrine that Litman finds ambiguous. It is indeed ambiguous: the doctrine holds that only elements of a work that originate with the author of the work are entitled to copyright protection; component facts, ideas, or public domain materials cannot be claimed for protection. In order to isolate the unprotectable elements, courts have developed exceptionally murky tests of “abstraction” and “filtration” to separate elements that are and are not copyrightable.⁹⁵ In this highly subjective

⁸⁹ See RICHARD A. POSNER, *ECONOMIC ANALYSIS OF LAW* 53 n.3 (4th ed. 1992); see also Johnston, *supra* note 56, at 267 (noting the potential efficiency of blurry rights in intellectual property).

⁹⁰ See Wendy Gordon, *Fair Use as Market Failure: A Structural and Economic Analysis of the Betamax Case and its Predecessors*, 82 COLUM. L. REV. 1600 (1982).

⁹¹ See 17 U.S.C. § 107 (1994).

⁹² See Gordon, *supra* note 90.

⁹³ See POSNER, *supra* note 89.

⁹⁴ See Gordon, *supra* note 90, at 1629.

⁹⁵ This approach was first articulated by Learned Hand in *Nichols v. Universal Pictures*

inquiry, the court is obligated to first determine the level of abstraction of the elements—are they closer to general ideas, or to specific expression?⁹⁶ The court then “filters” out the unprotectable elements, considering only the copyrightable remainder.⁹⁷ The protectable elements of the work are then compared to the allegedly infringing work to see if they are “substantially similar.”⁹⁸ Almost no one, including experienced copyright attorneys, can determine in advance what the outcome of such a test might be, because it is a highly subjective matter. This is another classic example of a muddy entitlement, and appears to have evolved in this fashion for much the same purpose as fair use. In many instances, it will encourage informal bargains among creators and subsequent users, but at some threshold, litigation to allocate ownership will occur.

B. *Shared Property Rights*

The discussion to this point has shown how “muddy” entitlements may be appropriate in cases of high transaction costs. But in her discussion of such rules, Carol Rose has noted that we may employ muddy rules even when transaction costs are low.⁹⁹ One justification for such use of muddy rules, noted with respect to the entitlement space graph above, is that muddy entitlements may also function in much the same way as a divided entitlement. Consequently, a prescription for muddy entitlements may resemble the various “shared property” analyses that have appeared in recent literature on property and intellectual property. From these analyses, we may glean some additional reasons as to why muddy entitlements have been used in copyright, and will continue to be appropriate for allocating rights in cyberspace.

1. Solomonic Bargaining

Considerable scholarly attention has been focused on the analysis of divided rights contained in the “Solomonic Bargaining” argument proposed by Ian Ayres and Eric Talley.¹⁰⁰ One can envision a situation in which Lee wishes to buy out Edwards’s

Corp., 45 F.2d 119 (2d Cir. 1930), *cert. denied*, 282 U.S. 902 (1931). For a more recent application, see *Computer Assocs. v. Altai*, 982 F.2d 693 (2d Cir. 1992) (applying abstraction/filtration test to software infringement case).

⁹⁶ See 4 NIMMER, *supra* note 71, § 13.03[F].

⁹⁷ See *id.* § 13.03[A].

⁹⁸ See *id.* § 13.03[A][1][a].

⁹⁹ See Rose, *supra* note 27, at 594.

¹⁰⁰ See Ayres & Talley, *supra* note 35.

interest in their divided cave—or any of a number of other situations involving the divided entitlements described above, such as a joint tenancy in land, or even partnership in a firm, where one or both of the partners wishes to buy the others' interest. Ayres and Talley argue that in such a situation, the divided entitlement will prompt market participants to forego some types of strategic bargaining that could otherwise impede a beneficial trade.¹⁰¹ This occurs because of each party's rational self-interest: given that the entitlement is divided, either party may ultimately prove to be the purchaser rather than the seller of the property, depending on the path negotiations take. Thus, neither Lee nor Edwards would wish to understate his valuation of the property, hoping to buy at a discount, as that statement may prompt from the other owner an offer to buy at that price.¹⁰²

The most surprising argument advanced by Ayres and Talley—that a Calabresi/Melamed liability rule may be superior to a property rule in promoting bargaining—has proven to be controversial,¹⁰³ and may at best be limited to a highly constrained set of factual circumstances.¹⁰⁴ Consequently, that aspect of their analysis will receive relatively little attention here. Instead, this discussion will focus on a point that has perhaps been lost in all the shouting about liability rules. Ayres's and Talley's subsidiary argument is that divided or “fractional” entitlements will also facilitate trade by reducing parties' incentives to bargain strategically.¹⁰⁵ Although they do not explicitly discuss “muddy” rules, they point specifically to “probabilistic” entitlements that may dampen strategic behavior.¹⁰⁶ Such probabilistic entitlements may, as indicated above, include muddy entitlements, because muddy entitlements entail uncertainty as to the extent of ownership.

Such an approach to divided entitlements may be particularly appropriate to bargains for creative works, because creators of such works stand in much the same strategic position envisioned by Ayres and Talley, not only with respect to bargains over

¹⁰¹ See *id.* at 1035.

¹⁰² See *id.* at 1045.

¹⁰³ See Louis Kaplow & Steven Shavell, *Do Liability Rules Facilitate Bargaining? A Reply to Ayres and Talley*, 105 YALE L.J. 221 (1995).

¹⁰⁴ See Ian Ayres & Eric Talley, *Distinguishing Between Consensual and Nonconsensual Advantages of Liability Rules*, 105 YALE L.J. 235 (1995).

¹⁰⁵ See Ayres & Talley, *supra* note 35, at 1073-74. This point was originally analyzed by Johnston, *supra* note 56.

¹⁰⁶ Cf. Johnston, *supra* note 56 (discussing comparative benefits of bargaining over “muddy” entitlements).

particular works, but with respect to the rules adopted to allocate works generally. Authors of creative works are necessarily consumers of creative works. As Archibald MacLeish observed: "A real writer learns from earlier writers the way a boy learns from an apple orchard—by stealing what he has a taste for and can carry off."¹⁰⁷ Although today an author may bargain as a seller of a finished work, seeking the maximum price for her creation, tomorrow she may bargain as a buyer, seeking access to the intellectual raw materials she needs for her next project.¹⁰⁸

2. Improved Entitlements

Another recent look at divided entitlements is that offered by Mark Lemley in his discussion of "blocking" patents and copyrights.¹⁰⁹ In patent law, it is possible for two different parties to hold patents on different aspects of the same technology—for example, one patent may cover an improvement on technology in an existing patent.¹¹⁰ In such a case, neither party may be able to commercialize the technology without infringing the rights in the other patent, so that the patents "block" one another.¹¹¹ This would seem to create a classic bilateral monopoly problem; but Lemley argues that divided entitlements such as those found in blocking patents actually serve to facilitate improvements in intellectual property.¹¹² This outcome is not necessarily a result of lessened strategic bargaining, as in the argument of Ayres and Talley. Rather, Lemley suggests that divided entitlements increase the potential gains from trade; when each party has a larger stake in the outcome of a negotiation, the negotiation is more likely to occur.¹¹³ In contrast, if complete control is given to the original creator of a work, there is little for the original developer and a potential improver to bargain over; because the original developer holds all the cards, there is no incentive for an improver to do any improving. Lemley suggests that since copyright has no doctrinal

¹⁰⁷ ARCHIBALD MACLEISH, *On the Teaching of Writing*, in A CONTINUING JOURNEY 227 (1968). See also Diane Conley, *Author, User, Scholar, Thief: Fair Use and Unpublished Works*, 9 CARDOZO ARTS & ENT. L.J. 15, 20-24 (1990); William W. Fisher, *Reconstructing the Fair Use Doctrine*, 101 HARV. L. REV. 1661, 1729-30 (1988).

¹⁰⁸ See Lydia Pallas Loren, *Redefining the Market Failure Approach to Fair Use in an Era of Copyright Permission Systems*, 5 J. INT. PROP. L. 1, 24 (1997).

¹⁰⁹ See Mark A. Lemley, *The Economics of Improvement in Intellectual Property*, 75 TEX. L. REV. 989 (1997).

¹¹⁰ See generally 7 DONALD S. CHISUM, PATENTS § 20.03[3] (1998).

¹¹¹ See *id.*

¹¹² See Lemley, *supra* note 109, at 1064-65.

¹¹³ See *id.* at 1062-63.

equivalent to blocking patents, this will be the result for improvements on copyrightable subject matter.¹¹⁴

Although Lemley's argument is offered largely in terms of divided entitlements, a "muddy" entitlement rule may serve much the same purposes. This has some important implications both for his argument and for the present analysis. Copyright may lack a parallel doctrine to that of blocking patents, but infringement doctrines such as "abstraction/filtration" and "substantial similarity," together with fair use, create uncertainty as to the extent of an author's entitlement. Such uncertainty makes enforcement an uncertain proposition, except perhaps in the most egregious cases of slavish copying. Even if an enforcement suit is brought, the muddy copyright doctrines leave the court considerable latitude to excuse socially valuable copying. Consequently, it may be that improvement in copyright is not as impeded as we might at first expect: muddy copyright doctrines will cause copyright owners and copyright users to view their "stakes" in a copyrighted work probabilistically, increasing the likelihood of negotiation for valuable improvements.

3. Democratic Spillover

An additional perspective deserves consideration: that of the "democratic paradigm" articulated by Neil Netanel.¹¹⁵ Netanel's discussion does not at first appear to be a "shared property" analysis, at least not in the sense of the Ayres/Talley and Lemley analyses. However, Netanel provides a related rationale for embracing "muddy" entitlements in at least some instances. Netanel's discussion is not couched in economic terms, and one suspects that he might object to its reformulation in such a fashion: the democratic paradigm, he informs us, is in the market but not of the market.¹¹⁶ Nonetheless, it appears that his argument can be encompassed within an economic one. According to Netanel, copyright ownership should be calibrated in such a way that it serves to foster democratic ideals. In essence, Netanel suggests that significant positive externalities are generated by open access to informational works.¹¹⁷

This view indicates an additional role for muddy intellectual

¹¹⁴ See *id.* at 1071.

¹¹⁵ See Neil Weinstock Netanel, *Copyright and a Democratic Civil Society*, 106 YALE L.J. 283 (1996).

¹¹⁶ See *id.* at 386.

¹¹⁷ Cf. Loren, *supra* note 108, at 33-34 (discussing market failure in external benefits).

property entitlements. Copyright holders are unlikely to consider such beneficial spillover effects in choosing their price and level of production. Consequently, the copyright statute is designed to allow considerable latitude to users or consumers in taking from copyrighted works, particularly where the social value of the taking is high and transaction costs are prohibitive. The muddy copyright entitlements considered here may facilitate such valuable takings. First, by obscuring the boundaries of the copyright holders' entitlements, a muddy rule discourages attempts at enforcement where the unauthorized taking is small: the expected return from litigation will be too small to justify the expenditure in enforcement, and this gives new creators some breathing room when drawing, as they must, on previous creations. Second, for larger or more extensive takings, the muddy standard channels the dispute into court, where a third party arbiter can take into account the public value of the taking when rendering a decision on infringement. Thus, "muddy" standards may facilitate efficient use of intellectual property when the community "shares" a portion of the entitlement as external benefits.¹¹⁸

III. CYBERSPACE TRANSACTION COSTS

The previous Section suggests a series of reasons why "muddy" entitlements have been and continue to be appropriate to govern the disposition of intellectual property in creative works. But these arguments, even if accepted, do not necessarily prove the case for muddy rules in cyberspace. It could be argued—indeed, Trotter Hardy has argued—that conditions in cyberspace may be more favorable to clear, undivided property entitlements than are conditions in "real space."¹¹⁹ This argument rests upon the assumption that costs for electronic transactions will be as low as or lower than those in physical space.¹²⁰ Yet a careful consideration of on-line transactions suggests quite the opposite: not only could transaction costs in cyberspace be at least as high as those in "real space," but transaction costs on-line may in some instances be higher. Still, under such conditions, muddy rules will continue to be appropriate.

To develop this theme, this Section turns to a discussion of the comparative costs of reaching on-line bargains for intellectual

¹¹⁸ Cf. Gordon, *supra* note 90, at 1630-31 (arguing for application of fair use in situations of market failure involving "external benefits" or "non-monetizable interests").

¹¹⁹ See Hardy, *Property (and Copyright) in Cyberspace*, *supra* note 25.

¹²⁰ See *id.* at 236-37.

property. The discussion takes as its guide some portions of Professor Hardy's instructive arguments as to why cyberspace is ripe for "strong" property rules. This discussion does not constitute a complete reply to Hardy's arguments, but only offers an examination of four key issues regarding on-line transactions costs. In three instances—delineating borders, lowering search costs, and legislative rent-seeking—Professor Hardy has explicitly addressed the costs involved, although the discussion here will show that his explication is incomplete. In the fourth instance, that of jurisdictional uncertainty, Professor Hardy apparently has overlooked the associated transaction costs, though issues of jurisdiction hold important implications for the costs that he does discuss.

A. *Demarcating Borders*

Much of Hardy's argument for property entitlements in cyberspace rests upon the contention that property in cyberspace can be clearly demarcated.¹²¹ Following the real property arguments of Demsetz¹²² and Ellickson,¹²³ Professor Hardy argues that property rights are most appropriate where clear borders can be easily and cheaply drawn—in other words, where borders are cheap, people will "buy" more of them.¹²⁴ In such an environment, recognizing, policing, and transferring property are simpler because clear demarcations are readily available. This theory of demarcation has clear implications for the choice between "muddy" standards and clear rules, as adoption of muddy standards is more likely to be indicated where the cost of clear demarcation is high.

Hardy argues that cyberspace offers conditions under which demarcation is cheap.¹²⁵ He observes, for example, that information on the Internet can be easily bordered by the hierarchical designations of files and folders—indeed, this is how computer information systems are now structured.¹²⁶ Professor Hardy thus suggests that the boundaries of a digitized work, such

¹²¹ See *id.* at 242.

¹²² See Demsetz, *supra* note 24.

¹²³ See Ellickson, *supra* note 50.

¹²⁴ See Hardy, *Property (and Copyright) in Cyberspace*, *supra* note 25, at 234; see also POSNER, *supra* note 89, at 35, 39-40 (arguing that when the benefits of an intellectual property system are greater than the cost of demarcation, the system should be established).

¹²⁵ See Hardy, *Property (and Copyright) in Cyberspace*, *supra* note 25, at 243-46.

¹²⁶ See *id.* at 243-44.

as a software file, can be easily determined by simply finding the beginnings and ends of computer files.¹²⁷ This, he argues, indicates that cyberspace should be amenable to the development of “strong” property entitlements.¹²⁸

However, determining boundaries may be somewhat trickier than simply looking for the last string of binary code in a certain computer file. Consider for a moment the analogy drawn by Hardy and others to the fencing of land¹²⁹—simply because land *can* be fenced does not mean that it *should* be fenced. The advent of cheap and plentiful fencing material, such as barbed wire,¹³⁰ may facilitate fencing, but certain configurations of fencing—say, in strips nine miles long and five inches wide—are probably not optimal for societal welfare. We would hope that market forces, if not common sense, would tend to drive fencing configurations toward a more reasonable arrangement. But there may well exist market failures or perverse incentives that will encourage overfencing or underfencing. For example, fencing open lands may have an adverse impact on the local biota, in which case the fencing imposes a social cost that may not be internalized by the fencer, and so will not be taken into account in determining the optimal area to fence.¹³¹ In such a situation it may be necessary to legally change the incentive structure, or even to legislatively mandate cost-effective fencing configurations.¹³²

This distinction between possible and desirable configurations of property claims has long been clear in the law of intellectual property, where legal fences are built not to preserve existing scarce resources, but to encourage creation of resources that will

¹²⁷ See *id.* at 243.

¹²⁸ See *id.* at 246.

¹²⁹ See *id.* at 242-43; see also O'Rourke, *supra* note 12, at 613 (discussing analogy to “virtual barbed wire”); Rose, *supra* note 24, at 138 (using barbed wire as an example of propertization from technological change).

¹³⁰ See generally Wayne Gard, *The Law of the American West*, in *THE BOOK OF THE AMERICAN WEST* 261, 292-93 (Jay Staples Monaghan ed., 1963); Scott S. Smith, *The Wire That Won the West*, *AM. HERITAGE INVENTION & TECH.*, Fall, 1998, at 34. See also Rose, *supra* note 24, at 138 (citing barbed wire as a technological advance that permitted overreaching). It is also worth noting the enormous social disruptions and range wars that erupted in the wake of barbed wire fencing. See ERNEST STAPLES OSGOOD, *THE DAY OF THE CATTLEMAN* 191-95 (1929); Smith, *supra*, at 38-40.

¹³¹ For example, fencing may block the migration of certain species, suggesting that open access “corridors” between fenced properties may be necessary. See Charles C. Mann & Mark L. Plummer, *Conservation Biology: Are Wildlife Corridors the Right Path?*, 270 *SCI.* 1428 (1995).

¹³² See *id.* In intellectual property, doctrines such as fair use and idea/expression may provide analogous access “corridors” in the legal “fence.”

be inexhaustible once created.¹³³ Just as we can find the beginning and end of a computer file, so too can we find the boundaries of a piece of art or a text. Copyrightable works found in real space are bounded by clear borders: frames, margins, bindings. But simply demarcating such a boundary is not, and never has been, a sufficient criterion for designating the “boundaries” of a copyrightable work. The fact that there is a painting within a certain frame, or words within certain margins, does not tell us what lines divide the ownership of the image or the words. Similarly, the fact that there is some code within the boundaries of a computer file does not tell us what lines divide the ownership of the encoded work.¹³⁴ These borders are relevant only to the demarcation of the embodiment of the work as a copy, not to the delineation of the borders of the work itself.¹³⁵ Indeed, this is precisely why we need legal rules to “fence” intellectual property in the first place: because of the difficulty of discerning a natural or physical boundary to the property.¹³⁶

It might, admittedly, be simpler to merely determine the edges of a painting or a piece of text, and to declare that all the work, original or not, within the border was the exclusive intellectual property of the possessor of the painting. But the demarcation chosen for intellectual property should bear some relationship to the legal goal we have in mind, and the physical boundary of the copy is not necessarily relevant to fostering creative works. It would be absurdly simple to similarly deploy a bright-line liability rule such as, “anything written on a Thursday can be reproduced subject to a compulsory license fee,” or to deploy a bright-line property rule such as, “anything digitized within this file is the exclusive property of whoever registers the file.” But those boundaries are arbitrarily chosen, and simply do not reflect the relevant demarcation of ownership in information.

Jessica Litman’s writings on the public domain, including the

¹³³ See Wendy J. Gordon, *Of Harms and Benefits: Torts, Restitution, and Intellectual Property*, 21 J. LEGAL STUD. 449, 450 (1992).

¹³⁴ See 17 U.S.C. § 202 (1994) (“Ownership of a copyright, or of any of the exclusive rights under a copyright, is distinct from ownership of the material object in which the work is embodied.”).

¹³⁵ Under the copyright statute, the *work* is the intangible intellectual creation of an author; works are embodied in *copies*. See *id.* § 101 (1994) (“‘Copies’ are material objects . . . in which a work is fixed . . .”).

¹³⁶ See Gordon, *supra* note 68, at 855 (comparing copyright law to fences and concluding that “if an author’s group wishes to have a court or legislature make new rules against copying, it should be prepared to show that their current fences are insufficient to provide adequate incentives”).

parable of the cherry tree mentioned above, remind us that the rules for demarcation of ownership in copyright are a very murky business.¹³⁷ Such “muddiness” is appropriate, as a proper determination of copyright boundaries is a costly proposition not to be undertaken lightly. Litman points out that what copyright calls the “public domain” is in fact a convenient fiction to accommodate the truth of C.S. Lewis’s classic observation that authors never create anything truly original.¹³⁸ Rather, authors draw liberally, consciously and unconsciously, upon what Lewis’s colleague Tolkein called the “Cauldron of Story”: that rich soup of collective consciousness where all the elements of creative thought have been slowly stewing for millennia.¹³⁹ Copyright purports to protect only original elements of creative works, but it would be enormously costly to demand that authors account for the origin of every ingredient in the works they dish up out of the Cauldron. The very muddiness of copyright originality doctrine avoids such costly exercises in demarcation.¹⁴⁰

Litman’s reminder about the cost of tracing originality is especially appropriate in the context of the Internet, where the mutability of digital works has brought the Cauldron to a rolling boil. A full discussion of the reasons that demarcation is costly would run far beyond the scope of this Article, but one reason deserves particular mention. A growing body of copyright scholarship reminds us that authorship is a complex process to which the reader may bring as much meaning and value as the

¹³⁷ See Litman, *supra* note 72, at 1004 (“[T]he concept of originality is a poor substitute for tangible boundaries among parcels of intellectual property because it is inherently unascertainable.”).

¹³⁸ Lewis observed:

“Creation” as applied to human authorship seems to me to be an entirely misleading term. We rearrange elements. . . . There is not a vestige of real creativity *de novo* in us. Try to imagine a new primary colour, a third sex, a fourth dimension, or even a monster which does not consist of bits of existing animals stuck together. Nothing happens.

Letter dated Feb. 20, 1943, in *THE LETTERS OF C.S. LEWIS* (W.H. Lewis ed., 1966); see also Pierre N. Leval, *Toward a Fair Use Standard*, 103 HARV. L. REV. 1105, 1109 (1990) (“There is no such thing as wholly original thought or invention.”).

¹³⁹ “Speaking of the history of stories . . . we may say that the Pot of Soup, the Cauldron of Story, has always been boiling, and to it have continually been added new bits, dainty and undainty.” J.R.R. Tolkein, *On Fairy Stories*, in *ESSAYS PRESENTED TO CHARLES WILLIAMS* (1947), reprinted in *THE TOLKIN READER* 26-27 (1966).

¹⁴⁰ See Litman, *supra* note 72 at 1019; see also Gordon, *supra* note 133, at 461 n.48 (“[T]he law does not give ownership rights in general ideas and discoveries . . . in part because of the high transaction costs that would be involved in tracing the effects of such building blocks.”).

originator.¹⁴¹ Thus, Rosemary Coombe writes of how a reader “recodes” text to yield a work that is the result of both reader’s and writer’s interpretation.¹⁴² Keith Aoki and Richard Rotstein refer to such recoded meanings as the “intertext” of a work.¹⁴³ In the work’s intertextual spaces, the respective contributions of author and reader are unclear and perhaps inseparable.

These observations on “intertext” and “recoding” may seem somewhat abstract and ethereal, far removed from the practicalities of property ownership. One might argue that even if a reader does “recode” a work or add meaning to it, this occurs largely in the reader’s mind, where the law does not inquire into the reader’s unfixed contribution to the work.¹⁴⁴ However, as Margaret Chon has observed, where digital works are concerned, the process of recoding quickly spills from carbon-based organic memory into silicon-based mechanical memory.¹⁴⁵ Chon cites the example of electronic mail “discussions” in which portions of previous messages are incorporated into replies.¹⁴⁶ The result is something different than the type of combined work that copyright is accustomed to dealing with—copyright recognizes that an author may adapt a previous author’s work to create a derivative work, or that two authors may combine their efforts to create a joint work.¹⁴⁷ But e-mail discussions do not appear to fit the previous copyright categories.¹⁴⁸

Similar digital melding of previously discrete works can be

¹⁴¹ See, e.g., JAMES BOYLE, *SHAMANS, SOFTWARE, AND SPLEENS: LAW AND THE CONSTRUCTION OF THE INFORMATION SOCIETY* (1996); Peter Jaszi, *Toward a Theory of Copyright: The Metamorphoses of “Authorship,”* 1991 DUKE L.J. 455.

¹⁴² See Rosemary J. Coombe, *Objects of Property and Subjects of Politics: Intellectual Property Laws and Democratic Dialogue*, 69 TEX. L. REV. 1853, 1864 (1991). Coombe has explicitly extended her analysis to creative works in digital media. See Rosemary Coombe, *Left Out on the Information Highway*, 75 OR. L. REV. 237 (1996) [hereinafter Coombe, *Left Out on the Information Highway*].

¹⁴³ See Keith Aoki, *Adrift in the Intertext: Authorship and Audience Recoding Rights*, 68 CHI.-KENT L. REV. 805, 810 (1993); Robert H. Rotstein, *Beyond Metaphor: Copyright Information and the Fiction of the Work*, 68 CHI.-KENT L. REV. 725 (1993).

¹⁴⁴ See 17 U.S.C. § 102 (1994) (“Copyright protection subsists . . . in original works of authorship fixed in any tangible medium of expression . . .”).

¹⁴⁵ See Margaret Chon, *New Wine Bursting From Old Bottles: Collaborative Internet Art, Joint Works, and Entrepreneurship*, 75 OR. L. REV. 257, 271-72 (1996).

¹⁴⁶ See *id.* at 261.

¹⁴⁷ See 17 U.S.C. § 101 (1994) (“A ‘joint work’ is a work prepared by two or more authors with the intention that their contributions be merged into inseparable or interdependent parts of a unitary whole.”).

¹⁴⁸ See Chon, *supra* note 145, at 270-72 (noting that jointly produced on-line communications do not meet the statutory requirements for a joint work); see also Coombe, *Left Out on the Information Highway*, *supra* note 142, at 245-47.

seen in the case of the World Wide Web, in which users may move seamlessly from one work to another, frequently not knowing or caring whether the files displayed are transmitted from the same site or different sites.¹⁴⁹ This interconnection of previously discrete works has fostered a feeling among some web page owners that their material has somehow been used or adapted without their permission.¹⁵⁰ For example, much of the recent controversy surrounding “in-line framing” of web materials stems from the difficulty of neatly parsing the problem into traditional copyright categories. Several legal disputes have arisen over the practice of one web page providing a hypertext link to another web page, and then displaying the linked page in a “frame” generated by the linking site.¹⁵¹ For example, in the TotalNews dispute, a web site called TotalNews offered hypertext links to well-known news sites, such as the *Washington Post* web site; when the link was activated, the *Washington Post* site would be displayed in a frame containing material from TotalNews.¹⁵²

At first glance, the displayed result or “framing” might seem to constitute some type of copyright infringement, such as an unauthorized derivative work of the *Washington Post*’s content. Yet several commentators have persuasively shown that when the document is retrieved via hypertext link, no direct infringement, contributory infringement, or vicarious infringement occurs: the framed materials are called directly from the content provider’s server and never pass through the framer’s server.¹⁵³ The linking server provides only instructions on where to find the linked material, and the framed image is then assembled by the viewer’s computer.¹⁵⁴ Even though the final result appears to be a different work from the one contemplated by the content provider, the mechanics of the network do not fit within the acts of adaptation or authorship deemed relevant under the copyright statute. The

¹⁴⁹ See KATSH, *supra* note 1, at 246-47; Pamela Samuelson & Robert Glushko, *Intellectual Property Rights for Digital Library and Hypertext Publishing Systems*, 6 HARV. J. L. & TECH. 237 (1993).

¹⁵⁰ See, e.g., *Ticketmaster Corp. v. Microsoft Corp.*, No 97-3055 DDP (C.D. Cal. filed May 9, 1997); *Futuredantics, Inc. v. Applied Anagramics, Inc.*, 45 U.S.P.Q.2d (BNA) 2005 (C.D. Cal. 1997).

¹⁵¹ See generally O’Rourke, *supra* note 12, at 634-39.

¹⁵² See Effross, *supra* note 16, at 659-60 (describing TotalNews litigation); O’Rourke, *supra* note 12, at 637-39 (same).

¹⁵³ See Burk, *supra* note 16; Cavazos & Miles, *supra* note 16; O’Rourke, *supra* note 12, at 662-68. *But see* Effross, *supra* note 16, at 664-81 (apparently accepting that web linking could be infringement).

¹⁵⁴ See Burk, *supra* note 16; Cavazos & Miles, *supra* note 16, ¶ 12 (especially Figure 1).

“authorship” of the displayed result is therefore unclear; under traditional analysis it seems to have been authored by no one.¹⁵⁵

Yet Professor Hardy argues that the apparent holism of the web can easily be parceled out by reductionist technology that tags and tracks where each component file originates and who owns it.¹⁵⁶ This may indeed be technically feasible, but is not actually determinative of the question of authorship of the composite web document. The boundaries of the individual files do not tell us what is original, and so copyrightable, in either the individual constituent files or their compilation. The question for copyright purposes is not so much what are the origins of the copies—in this case, the computer files—but what are the origins of the *work*.

Consequently, it seems clear that formulating any sensible demarcation of intellectual property in cyberspace will be a much higher-cost undertaking than demarcation of intellectual property in physical space—and the latter already can be a fairly high cost proposition.¹⁵⁷ While we could demarcate the ownership of cyberspace information with a clear and unambiguous rule—for example, “every other line of code belongs to the consumer”—that would hardly advance any of the plausible purposes for having intellectual property entitlements, and particularly not those professed by the strong property advocates.

B. *Search and Bargaining Costs*

Professor Hardy also identifies and discusses an additional set of transaction costs—those of search and negotiation, which he suggests will be drastically lower in cyberspace.¹⁵⁸ In order for intellectual property, or any other property, to change hands, buyers and sellers must be able to locate one another and reach some accommodation.¹⁵⁹ This cost of search and negotiation can be problematic in real space, but, contrary to Hardy’s argument, the current state of affairs on the Internet suggests that the costs of on-line transactions may be prohibitive. Simply finding on-line information that one might like to use or purchase is a major undertaking—the contents of the Internet might be likened to the contents of the Library of Congress, without call numbers, and

¹⁵⁵ See Burk, *supra* note 16; Cavazos & Miles, *supra* note 16, ¶ 25.

¹⁵⁶ See Hardy, *Property (and Copyright) in Cyberspace*, *supra* note 25, at 244.

¹⁵⁷ See KATSH, *supra* note 1 (questioning whether in digital media, “works with fixed boundaries” exist any longer).

¹⁵⁸ See Hardy, *Property (and Copyright) in Cyberspace*, *supra* note 25, at 237.

¹⁵⁹ See Robert P. Merges, *The End of Friction? Property Rights and Contract in the “Newtonian” World of On-Line Commerce*, 12 BERKELEY TECH. L.J. 115, 116 (1997).

dumped out on the floor. In such an environment, where there is no comprehensive index or coherent filing system, finding a piece of information worth purchasing can be a discouraging task.

Assuming that information of interest can be found, subsequently finding the owner from whom to make the purchase is equally daunting. This latter problem is well illustrated in the quandary faced by Internet users who wish to make commercial use of one of the numerous unattributed jokes, stories, or essays that make their way around the Net. Such items are forwarded from person to person and from discussion group to discussion group. Clearly, the item is the subject of copyright, as is any text that is fixed in a tangible medium of expression, and commercial use probably requires the permission of the copyright holder. Consequently, the user should locate the copyright holder to negotiate a license. The likely copyright holder is the author of the item, or the author would likely know to whom the copyright was transferred. However, there are undoubtedly many propagators of the item in the chain of forwarding between the potential licensee and the author—indeed, the author may not have initially placed the material on-line at all.¹⁶⁰ Tracing the chain of the item's propagation, through relays by hundreds, thousands, or tens of thousands of previous recipients, is well-nigh impossible.¹⁶¹

The situation is little better when the item is attributed. There exists no comprehensive directory of Internet users.¹⁶² Electronic contact information is mercurial in any event; unlike changing physical addresses, changing e-mail addresses is relatively costless. For that matter, there may be no method for electronic communication with an author; the material may have been placed on-line by a third party, and could quite literally have come from an author located anywhere in the world. The potential purchaser of a license still has the problem of tracing the global physical whereabouts of the author.

Technology, we are told, may help to alleviate some of the

¹⁶⁰ See Niva Elkin-Koren, *Cyberlaw and Social Change: A Democratic Approach to Copyright Law in Cyberspace*, 14 *CARDOZO ARTS & ENT. L.J.* 215, 284-85 (1996) (noting the culture of redistribution on the Internet).

¹⁶¹ Hardy somewhat casually dismisses this problem by asserting that authors who wish to be paid will not remain anonymous. See Hardy, *Property (and Copyright) in Cyberspace*, *supra* note 25, at 244. He does not deal with the problem of authors who may not wish to be anonymous, but who nonetheless cannot be found by consumers in a cost effective manner. Nor does he deal with the problem, discussed *infra*, of authors (and consumers) who adopt partial anonymity or pseudonymity for strategic reasons.

¹⁶² See KROL & FERGUSON, *supra* note 11, at 286.

search costs associated with matching authors and users.¹⁶³ For example, Professor Hardy tells of how he used e-mail to contact author John Perry Barlow in order to get permission to copy and distribute an article of Barlow's in Hardy's class; were it not for the ease of e-mail, Hardy says, he might not have bothered asking permission.¹⁶⁴ This story is laced with some irony, given that Barlow is perhaps best known for his view that the digital chaos of the Net will soon bring an end to copyright as we know it—and, according to Barlow, quite properly, too.¹⁶⁵ But the story is surely atypical in other ways as well: Barlow is a prominent figure on the Net, whose works are well-attributed and whose contact information is easily ascertained. In general, finding or contacting a mere mortal on-line will be more difficult under present circumstances.

However, even if present technology does not always speed the search for resources and their owners, Hardy argues that future technology will soon alleviate the high cost of locating information online.¹⁶⁶ Microsoft CEO Bill Gates is equally enthusiastic about the use of technology to lower transaction barriers:

Information about vendors and their products and services will be available to any computer connected to the [information] highway. Servers distributed worldwide will accept bids, resolve offers into completed transactions, control authentication and security, and handle all the other aspects of the marketplace, including transfers of funds. This will carry us into a new world of low-friction, low-overhead capitalism, in which market information will be plentiful and transaction costs low.¹⁶⁷

This scenario of "low-friction" search costs might be accomplished using greatly improved search engines, software agents, or other sophisticated searching tools. Of course, such ideal tools are not currently available: it is for this reason that Net users jealously gather and guard their precious cache of bookmarks¹⁶⁸—there is no other way to assure oneself of finding an

¹⁶³ See Hardy, *Property (and Copyright) in Cyberspace*, *supra* note 25, at 237.

¹⁶⁴ See *id.*

¹⁶⁵ See John Perry Barlow, *The Framework for Economy of Ideas: Rethinking Patents and Copyrights in the Digital Age*, WIRE, Mar. 1994, at 84.

¹⁶⁶ See Hardy, *Property (and Copyright) in Cyberspace*, *supra* note 25, at 244-45.

¹⁶⁷ BILL GATES, *THE ROAD AHEAD* 158 (1995).

¹⁶⁸ See KROL & FERGUSON, *supra* note 11, at 130-31, 146-48 (describing automated web browser "bookmarks" and "favorite places").

on-line resource again.¹⁶⁹ It is not clear when such amazing search tools will become available. Neither is it clear what they will cost when they do become available—the price for such tools will have to be exceptionally low to facilitate tagging and retrieval of every chunk of information on the web. High-priced tagging may lead to creation of the system, or may cause the system to be available only at a cost that will itself pose a significant search cost.¹⁷⁰

But let us believe the futurists for a moment, and imagine an information infrastructure in the not-too-distant future in which every byte of information is tagged and monitored at a cost low enough to make tagging and monitoring worthwhile. This system would seem to solve the problem of locating proprietary information and identifying its owner. But this would only be the first step in solving the problem of search costs.¹⁷¹ Recall that under the most sophisticated rationale for a “strong” property regime, the purpose of creating the rights is to allow coordination of usage by a self-interested property owner. For this to happen, not only must potential buyers and sellers be able to locate one another, but the seller must be able to identify the buyer who places the highest value on the work.

In other words, in order to fit the strong property rationale, conditions must not merely facilitate the union of *potential* buyers and sellers, but the union of *optimal* buyers and sellers. To be sure, if a universe of potential buyers can be identified, then the property owner is a step closer to identifying the subset of buyers with the highest subjective valuations. But the cost of selecting from among potential buyers may itself be prohibitive. Both buyers and sellers have strong incentives to cloak their true preferences in order to capture a larger share of the gains from

¹⁶⁹ As Lemley & McGowan wryly note: “Anyone who has retrieved over 20,000 entries in an Altavista search will understand this problem.” See Lemley & McGowan, *supra* note 81, at 560 n.351.

¹⁷⁰ Such systems will be based on file address databases. See Clifford Lynch, *Identifiers and Their Role in Networked Information Applications*, ARL: A Bimonthly Newsletter of Research Library Issues and Actions, Oct. 1997, at 194. In this regard, it is worth noting that database publishers have sought new forms of intellectual property protection, which they claim are required to recoup the cost of assembling such tagged and indexed data. See generally J.H. Reichman & Pamela Samuelson, *Intellectual Property Rights in Data?*, 50 VAND. L. REV. 51 (1997) (describing proposals for database protection). To the extent that this is more than simply an example of legislative rent-seeking, it suggests that the electronic tools for locating information and its owners will not be priced at marginal cost. See *id.* at 124-36 (discussing the likely increase in costs attending new database protection).

¹⁷¹ See Merges, *supra* note 159, at 116 (noting that digital media do not necessarily lower all transaction costs).

trade.¹⁷² Such strategic behavior to either conceal or misrepresent one's true preferences may be particularly important to sellers hoping to increase their profits through price discrimination.¹⁷³

In short, transparency, or "friction free" dealing, may simply not be in the interests of on-line bargainers.¹⁷⁴ An early version of this problem was identified by Froomkin and DeLong in their survey of emerging electronic markets.¹⁷⁵ The authors employed a primitive software agent called Bargain Finder that can be programmed to query on-line vendors of music CDs in order to locate the best price for a given item. However, when they attempted to use the agent, the authors found that many vendors refused access to their publicly available information on prices.¹⁷⁶ There may be several plausible explanations for such refusal of access, most of which revolve around the merchant's desire to engage in price discrimination: the merchant may be reluctant to reveal a price for the item without being able to gauge the potential buyer's willingness to pay.¹⁷⁷ Alternatively, merchants may be anxious to encourage repeat business through non-price incentives, such as better service, which would not be communicated to the buyer via a "shop-bot" similar to Bargain Finder. Although we cannot be certain precisely why vendors might block the operation of such a shop-bot, this conduct fits the expected outcome for a model of strategic behavior rather than that for pure price-based competition.¹⁷⁸

¹⁷² See Polinsky, *supra* note 34, at 1092-93 (arguing that, in the presence of strategic behavior, an exclusionary rule such as an injunction will tend not to be efficient so long as the parties have gains from trade to bargain over).

¹⁷³ See Arnold Picot et al., *The Organization of Electronic Markets: Contributions from the New Institutional Economics*, 13 INFO. SOC'Y 107, 121-23 (1997). Thus, in the airline industry, carriers have counteracted the increasing transparency of electronic searching by creating "information overload," deploying a bewildering array of ticket prices that may change hundreds of times a day. See Yannis Bakos, *The Emerging Role of Electronic Marketplaces on the Internet*, COMM. ACM, Aug. 1998, at 35.

¹⁷⁴ See Picot et al., *supra* note 173.

¹⁷⁵ See J. Bradford DeLong & A. Michael Froomkin, *The Next Economy?*, in INTERNET PUBLISHING AND BEYOND: THE ECONOMICS OF DIGITAL INFORMATION AND INTELLECTUAL PROPERTY (D. Hurley, et al. eds., 1998).

¹⁷⁶ See *id.* Similar anecdotal experience with Bargain Finder is reported by Bailey and Bakos. See Joseph P. Bailey & Yannis Bakos, *An Exploratory Study of the Emerging Role of Electronic Intermediaries*, 1 INT'L J. ELECTRONIC COMM. 7, 11-12 (1997).

¹⁷⁷ This explanation is taken as a given by Bailey and Bakos, but is offered more tentatively by DeLong and Froomkin. Compare Bailey & Bakos, *supra* note 176, at 12 with DeLong & Froomkin, *supra* note 175.

¹⁷⁸ Preliminary empirical data gathered by the OECD tends to support the anecdotal experience of DeLong and Froomkin that on-line shopping is anything but "friction free." Books, music, and software sold on-line do not appear to be cheaper than that sold in real space, nor does the entry of competitors into electronic markets appear to depress price.

When this problem is considered in the context of electronic commerce, one soon realizes that the Internet might almost have been designed to facilitate strategic behavior. The difficulty of locating an e-mail address, alluded to previously, is only a prelude to the kind of personal obscurity the Net can bring.¹⁷⁹ On-line negotiations are stripped of much of the context that buyers and sellers might normally employ either to signal preferences or to infer preferences. Buyers and sellers may even choose to conduct negotiations through anonymous remailers or anonymous web sites.¹⁸⁰ The now hackneyed cartoon from the *New Yorker* proclaims that “On the Internet, no one knows you’re a dog”—but similarly, on the Internet, no one knows whether you are a multi-millionaire or a deadbeat. Thus, nascent designs for electronic commerce already contemplate “trusted third parties” to certify that a party to a transaction is indeed who he purports to be.¹⁸¹

Of course, what technology can cloak, technology can also reveal. Much of the current debate over electronic privacy stems from this concern: that merchants may gain the “upper hand” in the strategic bargaining game by extrapolating personal preferences from electronic records of consumers’ on-line activity.¹⁸² Consumers might find offers tailored to their particular tastes and abilities to pay, but they might also lose consumer surplus to producers in the process. Equally important, they will lose strategic bargaining leverage, as their preferences may be disclosed to the seller, but the seller’s cost curve remains

See ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, *ELECTRONIC COMMERCE: PRICES AND CONSUMER ISSUES FOR THREE PRODUCTS—BOOKS, COMPACT DISCS, AND SOFTWARE* (1998). Additionally, Bailey and Bakos note that non-price electronic agents, such as the “Firefly” system that comparison shops on the basis of product description, seem not to encounter seller resistance. See Bailey & Bakos, *supra* note 176.

¹⁷⁹ See A. Michael Froomkin, *Anonymity and Its Enmities*, 1995 J. ONLINE L. art. 4 (June 1995) <<http://www.law.cornell.edu/jol/jol.table.html>> (describing possibilities for on-line anonymity); Mark A. Lemley, *Rights of Attribution and Integrity in Online Communications*, 1995 J. ONLINE L. art. 2 (June 1995) <<http://www.law.cornell.edu/jol/jol.table.html>> (discussing legal rights in on-line personae); see also David G. Post, *Pooling Intellectual Capital: Thoughts on Anonymity, Pseudonymity, and Limited Liability in Cyberspace*, 1996 U. CHI. LEGAL F. 139, 163 (noting the ability of individuals or entities to establish multiple identities with distinct reputations on-line).

¹⁸⁰ See generally Froomkin, *supra* note 3, at 414-43 (describing mechanisms for on-line anonymity).

¹⁸¹ See generally A. Michael Froomkin, *The Essential Role of Trusted Third Parties in Electronic Commerce*, 75 OR. L. REV. 49 (1996).

¹⁸² See generally Froomkin, *supra* note 3, at 450-88 (describing on-line consumer profiling); Jerry Kang, *Information Privacy in Cyberspace Transactions*, 50 STAN. L. REV. 1193 (1998) (same).

undisclosed to the consumer. Thus, the brewing battle over on-line privacy is in essence a form of strategic meta-behavior by consumers to retain parity in bargaining relationships.¹⁸³ None of this bodes especially well for transparency in on-line commerce, including commerce in digital works. If strategic behavior by both parties to a transaction produces an impasse, creating a massive informational asymmetry in favor of one party may only worsen the situation: knowing that the other party is poised to capture all the surplus from the trade may prompt the disadvantaged party to hold out more tenaciously.¹⁸⁴

The convergence of such strategic behavior with attempts to tag and trace every byte of information in the digital environment, as described in the discussion of demarcation above, could actually turn cyberspace into a sort of transaction-cost hell. Digital multimedia works are typically arranged from a variety of previously existing sound, text, and graphics; hypertext works are similarly assembled from the linkage of existing resources. One might expect serious "holdout" problems to arise in this environment, as every copyright holder attempts to capture the full value of every use of his works.¹⁸⁵ Such holdout problems are well documented in the case of railroad rights-of-way and other composite real property transactions.¹⁸⁶ As in the case of Lee's cave, each property owner in a bilateral monopoly situation may attempt to hold out for a price equaling the full value of the complete entitlement; the more owners involved, the more likely holding out becomes. The classic solution for such holdouts in real property is the exercise of eminent domain; not surprisingly, at least one view of copyright fair use is to view it as a sort of public easement on the copyright owners' property rights, allowing limited access and use to the property if the public interest in the

¹⁸³ Cf. Peter H. Huang, *The Law and Economics of Consumer Privacy Versus Data Mining* (May 27, 1998) (draft article, available at <<http://www.ssrn.com>>).

¹⁸⁴ See Epstein, *supra* note 29, at 7. Robert Cooter has developed general models indicating that, under such conditions, bargaining will break down. See Robert Cooter, *The Cost of Coase*, 11 J. LEGAL STUD. 1, 20-21 (1982); Robert Cooter & Stephen Marks, *Bargaining in the Shadow of the Law: A Testable Model of Strategic Behavior*, 11 J. LEGAL STUD. 225 (1982); see also Robert P. Merges, *Intellectual Property Rights and Bargaining Breakdowns: The Case of Blocking Patents*, 62 TENN. L. REV. 75, 79 (1994) (finding evidence of such negotiation breakdowns in asymmetric patent bargaining).

¹⁸⁵ This is in fact the situation Michael Heller has dubbed the "tragedy of the anticommons." Michael A. Heller, *The Tragedy of the Anticommons: Property in the Transition from Marx to Markets*, 111 HARV. L. REV. 621 (1997).

¹⁸⁶ See Lloyd Cohen, *Holdouts and Free Riders*, 20 J. LEGAL STUD. 351 (1991).

use is sufficiently pronounced.¹⁸⁷ Thus, the legal tools to avoid holdout problems may already exist in copyright law, if they are not discarded under the mistaken assumption that on-line transactions will be “friction free.”

C. *Jurisdictional Uncertainties*

Because the Internet spans national borders, on-line activity creates a variety of jurisdictional and choice of law problems. For example, copyright can vary substantially among jurisdictions, and each jurisdiction's copyright regime will entail specific costs in terms of rights conferred or surrendered, procedural requirements, enforcement, and so on. This state of affairs presents formidable barriers to on-line negotiations over digitized materials. Courts have only begun to grapple with the question of what set of national rights attaches to a work when it comes into existence.¹⁸⁸ Beyond that, no clear decisional rule exists to determine the law that should be applied when information products are transmitted from one jurisdiction to another.¹⁸⁹ Judicial determination as to which jurisdiction's law will apply to a given legal claim is a matter of conflicts analysis, which is notoriously rife with muddy rules—such as so-called “interest analysis,” which attempts to weigh the interests of different jurisdictions in having their law applied to a particular dispute.¹⁹⁰

Buyers and sellers of informational products will need to take such details into account in determining the total “cost” of any intellectual property bargain—purchase of copyrighted materials is in fact purchase of a bundle of rights associated with those materials. Without knowing the parameters of those rights, buyers and sellers simply will not know the value of what they are buying and selling. They may, of course, attempt to clarify the question by contracting with one another regarding choice of law and choice of forum. Two obvious choices for such contractual

¹⁸⁷ See Gordon, *supra* note 133, at 476.

¹⁸⁸ See, e.g., *ITAR-TASS v. Russian Kurier, Inc.*, 153 F.3d 82 (2d Cir. 1998) (holding under conflicts analysis that the copyright in a disputed work was determined by Russian law, but infringement was determined by U.S. law).

¹⁸⁹ See Paul Edward Geller, *Conflicts of Law in Cyberspace: International Copyright in a Digitally Networked World*, in *THE FUTURE OF COPYRIGHT IN A DIGITAL ENVIRONMENT* 27 (P. Bernt Hugenholtz ed., 1996); Jane C. Ginsburg, *Global Use/Territorial Rights: Private International Law Questions About the Global Information Infrastructure*, 42 J. COPR. SOC'Y 318 (1995); see also Curtis Bradley, *Territorial Intellectual Property Rights in an Age of Globalism*, 37 VA. J. INT'L L. 505 (1997) (detailing territorial limitations on national intellectual property rights).

¹⁹⁰ See Trachtman, *supra* note 80.

provisions might be the law of the jurisdiction of origin and the law of the jurisdiction of receipt. But since negotiating such provisions for every use of on-line resources is itself burdensome, a default rule may be desirable. In real space transactions, it would be highly unusual—and burdensome—to negotiate choice of forum and choice of law each time one made a purchase at the bookstore, the supermarket, the dry cleaner, and so on. We rely on default rules of geographic jurisdiction that are not available in cyberspace.

Some commentators have suggested that adoption of a straightforward rule, such as “always use the law of the jurisdiction of receipt” or “always use the law of the jurisdiction of origin,” would simplify matters.¹⁹¹ But in fact the clarity of such a rule is illusory, at least for purposes of negotiation: buyers may not be able to determine in advance the location of the materials accessed, and so cannot determine the legal “cost” associated with the materials under a rule that adopts the law of the jurisdiction of origin. Similarly, sellers may not know the location of buyers, and so cannot calculate the correct price for the goods under a rule that adopts the law of the jurisdiction of receipt. Consequently, jurisdictional factors pose an additional cost to on-line transactions, either as negotiated items or as matters of uncertainty.

D. *Rent-Seeking and Transaction Costs*

An additional and, for our purposes, final set of transaction costs that Professor Hardy asserts can be lessened or avoided by a system of “strong” property entitlements includes those costs associated with legislative formulation of intellectual property statutes.¹⁹² As an example of such costs, he points to the most recent major revision of the U.S. Copyright Act, which involved many years of negotiation and Capitol Hill maneuvering to work out all the arcane details of who would receive which rights in the final statute.¹⁹³ Hardy suggests, quite correctly, that the accumulated cost of such lobbying, log-rolling, horse-trading, and

¹⁹¹ See, e.g., Jane C. Ginsburg, *Putting Cars on the “Information Superhighway”*: *Authors, Exploiters, and Copyright in Cyberspace*, 95 COLUM. L. REV. 1466 (1995).

¹⁹² See Hardy, *Property (and Copyright) in Cyberspace*, *supra* note 25, at 255.

¹⁹³ See *id.*; see generally Jessica D. Litman, *Copyright, Compromise, and Legislative History*, 72 CORNELL L. REV. 857 (1987) (detailing legislative deal-making in passing copyright statutes); Thomas P. Olson, *The Iron Law of Consensus: Congressional Responses to Proposed Copyright Reforms Since the 1909 Act*, 36 J. COPR. SOC’Y 109 (1989) (same).

general legislative shenanigans must be enormously wasteful.¹⁹⁴ It would be much simpler and cheaper, he argues, to simply adopt a strong property regime for cyberspace, and thus avoid all the costs of determining special interest carve-ins, carve-outs, exceptions, and privileges.¹⁹⁵

On its face, this seems a rather odd form of argument, as Hardy appears to be asserting that we can save the costs of decision by deciding beforehand. No effort will be wasted in hashing out the legislative details of intellectual property, he contends, because we already will have decided on a strong property right.¹⁹⁶ Of course, this begs the question of how that prior decision will be reached—if it is reached in the legislature, then we must expect the same tortuous process in reaching that prior decision as we would expect in reaching any other legislative decision. Surely powerful lobbies will work to ensure that the strong property right is assigned to their constituencies, or to carve out beneficial exceptions. Thus, any attempt to decide before we decide merely pushes the costs of decisionmaking back a step, but does not eliminate them. And if the prior decision on strong property rights is not to be made in the legislature, then who is to make it?

At a deeper level of consideration, the association of wasteful legislative activity with barriers to efficient trade is unusual. Hardy has clearly identified a set of real and substantial costs, but this observation is not new—such inefficiencies have long been recognized in the legislative process as a type of rent-seeking. Gordon Tullock and others have described at some length how special interest groups will attempt to capture the legislative process by expending funds on lobbying, because the potential returns, or rents, from such activity may be much higher than the return if those funds were invested in production, trade, or other marketplace activity.¹⁹⁷ Thus, Hardy correctly observes that such activity is likely to be socially wasteful; it expends resources by attempting to appropriate existing commodities, rather than produce guns or butter or anything else useful. Yet the costs are not a transaction cost of bargaining under some set of

¹⁹⁴ See Hardy, *Property (and Copyright) in Cyberspace*, *supra* note 25, at 257.

¹⁹⁵ See *id.*

¹⁹⁶ See *id.* at 257-58.

¹⁹⁷ See George J. Stigler, *The Theory of Economic Regulation*, 2 BELL J. ECON. 3 (1971); Gordon Tullock, *The Welfare Cost of Tariffs, Monopolies, and Theft*, 5 W. ECON. J. 224, 232 (1967).

entitlements, but the costs of determining those entitlements.¹⁹⁸

Curiously enough, the type of rent-seeking that Professor Hardy decries may be partially modulated by the interjurisdictional costs discussed in the previous section. The Internet facilitates the movement of informational goods between jurisdictions, and enables individuals to access those goods from a distance. This creates a set of complex interrelationships between legislative activity and market activity which I have discussed elsewhere and will not attempt to further explore here.¹⁹⁹ But it bears noting that the Internet may actually undermine external controls on legislative rent-seeking. Normally, the threat of competition from other jurisdictions would prompt legislatures to produce leaner and more efficient regulatory systems, rather than run the risk of seeing local production centers migrate to more favorable regulatory climates.²⁰⁰

But the Internet, in effect, facilitates regulatory spillovers that prevent the interjurisdictional "market" for regulation from functioning efficiently: transborder migration of digitized goods will likely undermine intellectual property incentives to create informational works. Given the opportunity to externalize the costs of domestic regulation, some nations may opt for permissive intellectual property regimes.²⁰¹ Offshore pirates may drive down the price of digitized goods by electronically copying and distributing the goods at extremely low cost. The Internet will tend to act as a conduit for these unauthorized versions of digitized works. More restrictive copyright regimes will have a difficult time excluding unauthorized copies from their territory, especially when infringers can retreat more easily to offshore havens.

As a consequence, the transborder migration of informational goods may militate the formation of some centralized or uniform international regulation of intellectual property rights in digital

¹⁹⁸ Thus, Professor Cohen points out that the cost of legislative bargaining, rather than being an unnecessary transaction cost, may be better conceptualized as a cost of production of law. See Julie E. Cohen, *Lochner in Cyberspace: The New Economic Orthodoxy of "Rights Management,"* 97 MICH. L. REV. 462 (1998).

¹⁹⁹ See Dan L. Burk, *The Market for Digital Piracy*, in BORDERS IN CYBERSPACE, *supra* note 2, at 205.

²⁰⁰ See Albert Breton, *The Existence and Stability of Interjurisdictional Competition*, in COMPETITION AMONG STATES AND LOCAL GOVERNMENTS: EFFICIENCY AND EQUITY IN AMERICAN FEDERALISM 37, 42 (Daphne A. Kenyon & John Kincaid eds., 1991); George J. Stigler, *Economic Competition and Political Competition*, 13 PUB. CHOICE 91, 93 (1972).

²⁰¹ See Joel P. Trachtman, *International Regulatory Competition, Externalization, and Jurisdiction*, 34 HARV. INT'L L.J. 47, 73 (1993).

goods—in essence, internalizing the cost of transborder spillovers by expanding the relevant border to cover the entire world. Unfortunately, this result simply means that socially wasteful rent-seeking will take place at the international, rather than national, level: special interest groups may lobby for treaties that centralize or harmonize international laws.²⁰² A recent example of this appears in the proceedings of negotiations to update international copyright treaties; having failed to get their desired copyright concessions in domestic legislation, special interest lobbyists sought to introduce their preferred result into international treaties.²⁰³

Thus, supra-national rule-making for the Internet would simply move the costs of rent-seeking from the national arena to the international arena. The danger of such internationalization is that it lacks the external control mechanism of interjurisdictional competition; when a wasteful law is imposed internationally, there is no offshore haven available, and so no credible threat of exit to moderate political favoritism. The result may be rent-seeking activity with regard to Internet entitlements that proves far more costly than that previously seen for real space entitlements.

IV. THE BENEFITS OF AMBIGUITY

If, as I have suggested in the previous Section, transaction costs in cyberspace can be expected to remain as significant as those in real space, and, in some instances, perhaps even more significant, then we must seriously consider retaining the types of “muddy” entitlements found in real space intellectual property regimes. Until now, my discussion has been largely critical, and has largely considered why we ought to be suspicious about calls to adopt clear on-line entitlements as part of the “strong” property regime advocated by several commentators. In this Section, the discussion turns to a more positive program and suggests a variety of benefits that may flow from retaining “muddy” standards for copyright in cyberspace.

A. *Informal Solutions*

As indicated in the introduction to “muddy” entitlements in Section I above, one purpose for adopting such standards is to

²⁰² See Roland Vaubel, *A Public Choice View of International Organization*, in *THE POLITICAL ECONOMY OF INTERNATIONAL ORGANIZATIONS* 27, 30 (Roland Vaubel & Thomas D. Wilbert eds., 1991).

²⁰³ See Samuelson, *The U.S. Digital Agenda at WIPO*, *supra* note 23.

shunt buyers and sellers of property into informal negotiating systems, particularly where the transaction cost of formal negotiations will be high. The concept of such “informal” or “self-help” systems as an alternative to strong property rights has a long tradition in the discussion of copyright law.²⁰⁴ Tom Palmer has argued, for example, that supposedly public goods can frequently be financed without the creation of a state-sponsored exclusive right.²⁰⁵ Palmer reminds us of Ronald Coase’s discovery that the cost of a lighthouse—supposedly a classic example of a public good—was in fact internalized by a clever system of private rents.²⁰⁶ Admittedly, the direct benefits of a lighthouse would seem to be both non-rival and non-excludable; any ship within sight of the lighthouse could use it as a warning beacon. But in fact, fees for the maintenance of the lighthouse could be extracted from ships docking in adjacent ports—indeed, such ships would have derived the greatest benefit from the beacon, and would likely have valued it most highly.²⁰⁷ Consequently, by “tying” the use of the port to the maintenance of the lighthouse, a private rent could be used to subsidize a public good.

Palmer suggests that similar alternatives may be available in the case of informational goods, obviating all or most of the need for copyrights.²⁰⁸ Examples of such arrangements abound in industries that nominally enjoy copyright protection, but where such protection is very difficult to police: for example, software publishers offering “upgrades” or customer service for software, or text publishers offering updates or “pocket parts” for printed treatises. Similarly, innovators in markets where copying is inevitable and uncontrollable may “tie” easily copied works to goods or services that cannot be copied easily. This results in the so-called “Netscape” business strategy, named after the popular software developer that first employed it, in which distribution of the first product assists in seizure of “mindshare,” but actual profits are made from sale of the second, more controllable, product.²⁰⁹ Significantly, this strategy distributes the primary good

²⁰⁴ See Gordon, *supra* note 68, at 856 n.13 (discussing the desirability of self-help alternatives to copyright).

²⁰⁵ See Tom Palmer, *Intellectual Property: A Non-Posnerian Law & Economics Approach*, 12 *HAMLIN L. REV.* 261 (1981).

²⁰⁶ See Ronald Coase, *The Lighthouse in Economics*, 17 *J.L. & ECON.* 357 (1974).

²⁰⁷ See *id.* at 362.

²⁰⁸ See Palmer, *supra* note 205, at 287-300.

²⁰⁹ Wendy Gordon offers a parallel example in real property; purportedly, the Disney corporation bought up the land surrounding its Epcot Center attraction in order to capture the beneficial spillover in hotel and restaurant business. See Gordon, *supra* note

at marginal cost—for free—in order to map the extent of the market that desires the product, then sells related products to those who reveal their preference for the optimally priced primary good.²¹⁰

These principles have been explicitly extended to cyberspace by commentators such as John Perry Barlow and Esther Dyson.²¹¹ In a set of widely cited and highly controversial articles, both Barlow and Dyson have argued that the easy reproduction and distribution of digital works will disable copyright as we know it. In the absence of effective legal recourse, they contend, content producers will rely on other methods to extract value from their labors. Their list of non-legal alternatives includes possibilities such as those suggested by Palmer and others.

This possibility of non-copyright alternatives has not been entirely lost on the “strong” property advocates. Professor Hardy has compared the protection of intellectual property to a pie with several slices comprising the whole.²¹² He identifies a copyright slice, and other slices as well: a contract slice, which offers an alternative form of legal protection; a “natural barriers” or state-of-the-art slice, which addresses the difficulty of copying works in a particular medium; and a technological protection slice, which allows the erection of additional barriers to copying.²¹³ Hardy argues that if any one of these slices shrinks, the others must expand to fill the empty space.²¹⁴ He suggests, for example, that

133, at 471. Conceivably, if returns on the spillover business were sufficient, such a strategy would allow the sale of tickets to the park at a reduced price, even for free, in order to attract the spillover business.

Note also that this strategy is the inverse of the “open” software development described by Lemley and McGowan. See *supra* note 81 and accompanying text. The open development strategy is analogous to the owner of a theme park purchasing the surrounding land and then inviting hotels and restaurants to freely build on that land, on the theory that revenues at the park would thereby be enhanced.

²¹⁰ Thus, distributing the good at marginal cost represents the logical endpoint of Ed Kitch’s observation that intellectual property holders will tend not to price as monopolists, in order to determine the true extent of their market. See Kitch, *supra* note 67 (discussing market power of patent owners). This strategy also answers Wendy Gordon’s concern that “in a market without intellectual-property rights, an author may want to bargain with her audience for payment, but the audience cannot be identified in advance.” Gordon, *supra* note 133, at 475. The free distribution of the software identifies the audience for future bargains.

²¹¹ See Barlow, *supra* note 165; Esther Dyson, *Intellectual Value*, WIRED, July 1995, at 136.

²¹² See I. Trotter Hardy, *Contracts, Copyrights, and Preemption in a Digital World*, 1 RICH. J.L. TECH. 2 (April 17, 1995) <<http://www.urich.edu/~jolt/v1i1/hardy.txt>>; Hardy, *Property (and Copyright) in Cyberspace*, *supra* note 25, at 223-34.

²¹³ See Hardy, *Property (and Copyright) in Cyberspace*, *supra* note 25, at 226.

²¹⁴ See *id.*

within the context of digital media, the “state-of-the-art” slice has shrunk, as copying bits is exceptionally easy.²¹⁵ He therefore suggests that technological barriers, copyright, or contract should be relied upon to fill the resulting breach.²¹⁶

Hardy and Palmer are therefore in agreement that alternatives to copyright are both available and necessary. But the Palmer analysis, supplemented by Barlow and Dyson, suggests that Professor Hardy’s analysis is several slices short of a pie.²¹⁷ We have already shown one slice that Hardy does not consider—the “tying slice.” But there are other slices missing as well. The second, and perhaps largest, missing slice might be termed the “first to market” slice. It is well understood in many industries that copying is inevitable and uncontrollable. Innovators in such markets structure their business plans so as to make their profits in the period between the time when their product reaches the market and the time when their competitors have produced a competing clone product. When free-riding competitors reach the market, it may become impossible to make a profit on the original product. The innovators simply plan to move on to their next innovation at that time—and of course plan to copy the competitor’s innovations themselves when given the opportunity.

A third missing slice might be termed the “sponsor” slice. Esther Dyson has suggested that in some instances artists may find patrons who will sponsor their creative works.²¹⁸ This could take a variety of forms. Dyson likely had past systems of aristocratic patronage in mind. Justice Stephen Breyer suggested long ago that advance subscriptions to creative works might operate to remunerate authors without resort to copyright.²¹⁹ However, our current system of support for radio and television programming is a “patronage” system of sorts, under which corporate sponsors underwrite the costs of creation in return for advertising space. This is perhaps not an attractive option,²²⁰ but advertising sponsors

²¹⁵ See *id.* at 228.

²¹⁶ See *id.*

²¹⁷ Professor Cohen has reached a similar conclusion. See Cohen, *supra* note 198, at 510.

²¹⁸ See Dyson, *supra* note 211, at 183.

²¹⁹ See Stephen Breyer, *The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computer Programs*, 84 HARV. L. REV. 281 (1970); see also Gordon, *supra* note 133, at 471 (“If the volunteer thinks the law will not give restitution, then she will seek to make a bargain by asking the potential recipients for contributions before the bargain begins.”).

²²⁰ See Margaret Jane Radin, *Property Evolving in Cyberspace*, 15 J.L. & COM. 509,

are already ubiquitous on the Net.

Two additional missing slices should be mentioned for the sake of completeness, although Professor Hardy would doubtless be appalled to pull such plums out of his pie. The first is the “usage tax” slice, under which government agencies make a direct transfer from potential infringers to authors. Something of this sort has occurred with respect to the import of digital audio tape (“DAT”) recorders, which are capable of making copies of music recordings with perfect fidelity.²²¹ Congress has imposed a tax on the sale of such equipment, and the funds were divided up among the record labels, which have presumably lost some sales due to unauthorized copying.²²² A related and final slice of pie is the “direct subsidy” slice, whereby the government directly supports creative works through funds such as the National Endowment for the Arts. Of these two, the usage tax is preferable, presumably because it maintains some connection between those consuming the good and those producing it.²²³

This list of protection alternatives—which is probably incomplete—suggests that the question of copyright for digital works must be reviewed in a new light. Much of the discussion about the Barlow/Dyson thesis has revolved around the veracity of their claim that copyright is dead or mortally wounded.²²⁴ Little or no consideration has been given to whether their alternatives are desirable ones, regardless of the health of the copyright statute. In the on-line environment I have described, such alternatives may serve to lower or circumvent high transaction costs where strong property rights would simply lock buyers and sellers into an impossible situation that would leave no room for bargaining. Barlow and Dyson may then be right in this sense: copyright will not foster creativity by providing a clear and impenetrable legal bulwark against infringement. Yet copyright may continue to be a viable tool to foster creativity as a “muddy” entitlement, by shunting buyers and sellers toward informal bargaining solutions in the majority of cases and toward courts in other cases, and by

521-22 (1996) (labeling such a prospect as “dystopic”).

²²¹ See PAUL GOLDSTEIN, *COPYRIGHT'S HIGHWAY: FROM GUTENBERG TO THE CELESTIAL JUKEBOX* 162-63 (1994).

²²² See Audio Home Recording Act of 1992, 17 U.S.C. §§ 1001-10 (1994).

²²³ This is due to the distorting effects of either a tax or a subsidy (which is, in effect, a negative tax). See PINDYCK & RUBINFELD, *supra* note 63, at 312-17. Whether the burden of the tax falls primarily upon producers or consumers depends upon the relative elasticity of supply and demand in the particular market. See *id.*

²²⁴ See, e.g., Lemley, *supra* note 6, at 548 (summarizing the debate over the “death of copyright”).

providing a flexible decisional rule in the latter cases.

B. *Rights Management Systems*

One option for “self-help” under muddy rules may be the deployment of copyright management systems as a way to deter unauthorized use of digital works, while facilitating purchase of authorized uses.²²⁵ Such management systems are in essence technological fences, designed to convert some of the “public goods” aspects of intellectual property back to “private goods.”²²⁶ Copyright holders may soon have at their disposal an array of such rights management systems—technologies that would block unauthorized access to a digitized work.²²⁷ Management systems may also serve to identify the owner of a work, monitor usage of the work, and charge pre-set fees for access to the work.²²⁸ Such systems may even facilitate micro-charges, under which consumers would pay by the word, pixel, or bit for access to the technologically-managed work.²²⁹ Some commentators have suggested that in such an environment, fair use doctrine is unnecessary, as consumers could be charged micropayments for small uses of copyrighted works that would not have been worth pursuing in previous media.²³⁰

Copyright management systems also seem to hold the potential for changing the cost/benefit calculus of creating

²²⁵ See Mark Stefik, *Letting Loose the Light: Igniting Commerce in Electronic Publication*, in *INTERNET DREAMS: ARCHETYPES, MYTHS, AND METAPHORS* 219 (Mark Stefik ed., 1996) [hereinafter Stefik, *Letting Loose the Light*]; Mark Stefik, *Shifting the Possible: How Digital Property Rights Challenge Us to Rethink Digital Publishing*, 12 *BERKELEY TECH. L.J.* 138 (1997) [hereinafter Stefik, *Shifting the Possible*].

²²⁶ See O'Rourke, *supra* note 12, at 613 (“Technologies such as password access and encryption may function like virtual barbed wire . . .”).

²²⁷ See Stefik, *Letting Loose the Light*, *supra* note 225, at 220-22; Stefik, *Shifting the Possible*, *supra* note 225, at 139-40.

²²⁸ See Jon Bing, *The Contribution of Technology to the Identification of Rights, Especially in Sound and Audio-Visual Works: An Overview*, 4 *INT'L J. L. & INFO. TECH.* 234, 261-66 (1996); Stefik, *Shifting the Possible*, *supra* note 225, at 142.

²²⁹ See Bing, *supra* note 228; Stefik, *Shifting the Possible*, *supra* note 225, at 142.

²³⁰ See, e.g., Tom W. Bell, *Fair Use vs. Fared Use: The Impact of Automated Rights Management on Copyright's Fair Use Doctrine*, 76 *N.C. L. REV.* 557 (1998); Merges, *supra* note 159, at 130. This analysis relies heavily on Wendy Gordon's insight that fair use can serve to cure market failures that occur when the transaction costs of small uses exceed the expected value of such uses. See Gordon, *supra* note 90. However, Professor Gordon never claims that this is the only type of market failure addressed by fair use. See *id.* at 1629; see also Loren, *supra* note 108. Professor Merges, at least, appears to acknowledge alternative bases for fair use, but sees them in terms of wealth distribution rather than efficiency. See Merges, *supra* note 159, at 134.

intellectual property rights in the first place.²³¹ In order to charge consumers for use of digital content, copyright management systems monitor consumers' reading or viewing habits, which entails collecting a considerable body of information on each consumer's preference.²³² Such monitoring lends itself to perfect price discrimination—that is, charging each consumer exactly his or her maximum price for the good.²³³ Perfect price discrimination is considered to be a solution to the “public goods” problem of intellectual property, because such pricing allows sellers to avoid the “deadweight loss” of potential consumers who might have purchased the good for a lower price; those consumers can then be charged the lower price while other consumers are still charged at higher prices.²³⁴ In so doing, however, the seller captures all the surplus of the bargain—a radical shift from current copyright practice.²³⁵

This shift is best understood by contrasting current market practice with future practices in a copyright management system environment. Currently, informational works are packaged in chunks, such as books. While some consumers will value the entire book, others will value only certain chapters or certain pages. The publisher does not know which consumers will value which portions of the book, and so the publisher will sell the book at an average price that will cover costs and hopefully appeal to many consumers.²³⁶ Some will value too few pages in the book to

²³¹ See GOLDSTEIN, *supra* note 221, at 8; Michael J. Meurer, *Price Discrimination, Personal Use, and Piracy: Copyright Protection of Digital Works*, 45 BUFF. L. REV. 845 (1997).

²³² Additionally, such information gathering raises serious concerns regarding constitutional privacy. See Julie E. Cohen, *A Right to Read Anonymously: A Closer Look at Copyright Management in Cyberspace*, 28 CONN. L. REV. 981 (1996).

²³³ See Meurer, *supra* note 231, at 878-79.

²³⁴ See Demsetz, *supra* note 70, at 300-06.

²³⁵ It is intriguing to note that current copyright law seems almost calculated to frustrate perfect price discrimination. In order to engage in price discrimination, the seller must have market power, be able to prevent after-sale arbitrage, and identify consumers with different preferences. See PINDYCK & RUBINFELD, *supra* note 63, at 387-88. The idea/expression doctrine attempts to limit copyright market power by ensuring the availability of close substitutes conveying the same information as any given work. The first sale doctrine ensures after-sale arbitrage of used copies of a work. Fair use and related copyright doctrines substantially interfere with identification of consumer preference. Cf. Meurer, *supra* note 231, at 859-66 (arguing that some copyright doctrines tend to frustrate price discrimination).

²³⁶ In fact, book publishers currently engage in imperfect price discrimination by packaging the same book in different formats—hardback, paperback, and so on—and releasing the different versions over time, with the most expensive version first. Consumers then sort themselves roughly by preference, with the consumers who value the book most—or at least value immediate access to the book—paying the higher hardback

pay the average price, but many consumers will value enough of the content to pay at least the price asked. Many consumers will receive a surplus; perhaps they value nearly the whole book, but are charged the price of only a few pages.

With copyright management systems, however, the situation changes substantially. The publisher can monitor usage and charge consumers per page—indeed, per word.²³⁷ Consumers who read the entire book will be charged for all the content. Consumers who read only parts of the book will be charged for only those parts. And consumers who would not have been willing to pay the average price can be charged less, based on however many words they read.²³⁸ However, no consumer will receive a surplus—that value will all be transferred to the publisher as additional profit.²³⁹ The value is not lost, and still benefits society generally, but it benefits information sellers rather than information buyers.²⁴⁰

Thus, putting such systems in place would seem to alleviate the high transaction costs that favored muddy copyright entitlements such as fair use.²⁴¹ Yet the availability of such systems, once they are fully developed, does not necessarily terminate the need for the “muddy” rule—this Article has reviewed a variety of reasons that muddy rules may be desirable even if transaction costs are low: for example, in order to encourage improvements or to deter strategic behavior. Copyright management systems are in essence a method of demarcating and tagging information—a form of technological “fencing.” As discussed above with regard to the costs of demarcation, such actual fences may or may not prove congruent with the desirable legal demarcation of information: like a painting in a frame, or words between covers, or binary on a disk, tagged and monitored digital works may contain considerable content that is unoriginal, public domain material, or material subject to fair use. This is one reason why current proposals to enforce copyright management

price, and consumers who value the book less buying it later in the lower-priced paperback edition. See PINDYCK & RUBINFELD, *supra* note 63, at 387-88.

²³⁷ See Stefik, *Shifting the Possible*, *supra* note 225, at 142.

²³⁸ See GOLDSTEIN, *supra* note 221, at 178-79. *But see* Meurer, *supra* note 231, at 897 (noting an alternative outcome to price discrimination where the monopolist may capture the surplus of high valuation buyers and not offer a discounted price to low valuation buyers).

²³⁹ See PINDYCK & RUBINFELD, *supra* note 63, at 373-74.

²⁴⁰ See William W. Fisher III, *Reconstructing the Fair Use Doctrine*, 101 HARV. L. REV. 1661, 1702 (1988).

²⁴¹ See GOLDSTEIN, *supra* note 221, at 218-19.

schemes are misguided; they would in essence change the technological fence into the legal fence, making the two arbitrarily coterminous.²⁴²

The benefits of retaining “muddy” copyright entitlements in this situation are perhaps clearest in the examples of either parody or unfavorable reviews of existing works.²⁴³ Granting the owner clear and complete control of the work would require a parodist or reviewer to seek permission to use the work parodied or reviewed. Yet the parody or review could well diminish or destroy the market for the work. In the absence of fair use, a copyright owner is likely to behave strategically—either denying permission to use the work for such purposes, or granting permission qualified upon approval of the final product.²⁴⁴ Positive externalities that might be achieved from the parody or review, including Netanel’s “democratic” benefits, either would not be considered by the copyright holder or would be foregone. A muddy entitlement, on the other hand, would give the parodist or reviewer room to either bargain for, or take portions of, the work, profit from their adaptation, and benefit society in the process. Additionally, recall that one purpose of a muddy legal rule may be to shunt ownership disputes into court, where a third party can consider the beneficial “spillover” in setting the proper level of access to a work. In order for this type of third party review to take place, the legal standard cannot be mapped onto an arbitrary and absolute technological demarcation; it must instead continue to be calibrated to prompt either acquiescence to access, or litigation over appropriate access.

Yet assuming that some muddy ownership rules are retained even in the face of copyright management system technology, the question of access remains—copyright management systems, like fences, will physically restrict access to the work. We could decide to retain the “muddy” concepts of originality, fair use, and so on, giving consumers a right to certain unauthorized uses of digital works, but consumers cannot exercise that right if they cannot gain

²⁴² See generally Cohen, *supra* note 5 (reviewing recent legislative proposals to protect copyright management systems).

²⁴³ See Gordon, *supra* note 90, at 1632 (identifying parody as an example of an uncompensated external benefit); Merges, *Are You Making Fun of Me?*, *supra* note 64 (same); Richard A. Posner, *When is Parody Fair Use?*, 21 J. LEGAL STUD. 67 (1992) (same); Anastasia P. Winslow, *Rapping on a Revolving Door: An Economic Analysis of Parody and Campbell v. Acuff-Rose Music, Inc.*, 69 S. CAL. L. REV. 767 (1996) (same).

²⁴⁴ This was the situation, for example, in *Campbell v. Acuff-Rose Music, Inc.*, 510 U.S. 569 (1994), where the rap group 2 Live Crew first attempted to bargain for the right to offensively parody Roy Orbison’s song, *Oh, Pretty Woman*; after being turned down, they relied on fair use to produce their parody anyway.

access to the material in the first instance. The question becomes whether consumers are entitled to some type of unauthorized fair access and if copyright owners refuse access, whether consumers are entitled to self-help analogous to the Wild West activity of “fence cutting.”²⁴⁵

The problem with fence cutting is, of course, that first, in the Old West, both legal and illegal fences were cut;²⁴⁶ and second, it leads to range wars.²⁴⁷ Professor Hardy worries that if copyright management system “fences” are not endorsed and enforced by law, there could develop a type of technological “arms race” between copyright owners and consumers.²⁴⁸ The argument is that no matter how sophisticated the copyright owner’s management technology, sophisticated users of digital content may develop the tools to “hack” around the copyright management systems. If sufficient revenue is lost from such circumvention, content owners will be prompted to develop more secure, tamper-resistant management systems, which would, in turn, prompt more sophisticated circumvention. Professor Hardy suggests that such competition in hacking and protection technology constitutes a wasteful investment by both sides.²⁴⁹

However, the image of a digital “arms race” is a bit ironic in the context of the Internet, and serves to remind us that the Internet is itself the product of a *literal* arms race.²⁵⁰ But technological arms races are not necessarily undesirable—indeed, competitive markets are premised upon a sort of arms race among competitors to produce consumer goods. The issue is not so much how to deter technological arms races, but, rather, how to arrange incentives so that the arms races that occur are socially productive rather than socially wasteful.²⁵¹ A useful illustration of such an arrangement is the current incentive structure of trade secrecy.

²⁴⁵ See Smith, *supra* note 130, at 39.

²⁴⁶ After the advent of barbed wire, ranchers fenced not only their own privately held property, but also large portions of public lands. See *id.* at 38. The problem eventually required both state and federal legislatures to penalize both unauthorized fencing and unauthorized fence cutting. See *id.* at 40.

²⁴⁷ See *id.* at 39.

²⁴⁸ See Hardy, *Property (and Copyright) in Cyberspace*, *supra* note 25, at 251.

²⁴⁹ See *id.*

²⁵⁰ The protocols upon which today’s Internet is based were developed as part of a Department of Defense cold war research program. See KROL & FERGUSON, *supra* note 11, at 14-15; Mark Giese, *From ARPAnet to Internet*, in COMMUNICATION AND CYBERSPACE: SOCIAL INTERACTION IN AN ELECTRONIC ENVIRONMENT 125, 126 (L. Strate et al., eds., 1996). The goal of the research was in part to develop a decentralized communications system that could remain operable despite damage. See *id.*

²⁵¹ Cf. Merges & Nelson, *supra* note 64, at 868-79 (discussing wasteful races to invent).

The law of trade secrets protects valuable business information that is not generally known in an industry, but which gives the possessor a business advantage.²⁵² The information is protected from certain types of disclosure, so long as the possessor takes reasonable steps to keep the information confidential.²⁵³ The law then penalizes competitors who obtain the information by improper means, such as theft or industrial espionage.²⁵⁴

The initial puzzle attending this body of law is why such secrecy is permitted at all, given the general rule that society would be better off if information were widely available.²⁵⁵ Secrecy tends to impair the function of competitive markets, forcing firms to either reinvent knowledge already held by competitors, or to use the less desirable information that no one wishes to keep proprietary. The answer to this puzzling practice would seem to lie in the efficiency gains from deterring a wasteful arms race in actual secrecy.²⁵⁶ Trade secrecy is not actual secrecy; it offers a less expensive legal alternative to measures that would ensure actual secrecy.²⁵⁷ The presence of trade secrecy protection thus tends to deter the holders of valuable information from wastefully over-investing in secrecy measures.²⁵⁸ At the same time, the trade secret law penalties for acquiring information by improper means deter competitors from investing in wasteful practices such as industrial espionage.²⁵⁹

Yet it is crucial to bear in mind that trade secrecy does not bar

²⁵² See RESTATEMENT (SECOND) OF TORTS § 757 cmt. b (1965); UNIFORM TRADE SECRETS ACT § 1 commentary, 14 U.L.A. 433 (1985).

²⁵³ See RESTATEMENT (SECOND) OF TORTS § 757 (1965).

²⁵⁴ See UNIFORM TRADE SECRETS ACT § 1, 14 U.L.A. 433 (1985). The comments to the Uniform Trade Secrets Act point out that even otherwise lawful conduct, such as flying an airplane over a manufacturing plant, may be improper when used to discover a trade secret. *Id.* commentary (citing *E.I. duPont de Nemours & Co. v. Christopher*, 431 F.2d 1012 (5th Cir. 1970)).

²⁵⁵ See David D. Friedman et al., *Some Economics of Trade Secret Law*, 5 J. ECON. PERSP. 61, 63 (1991).

²⁵⁶ See *id.* at 69-70; cf. Richard A. Posner, *The Right of Privacy*, 12 GA. L. REV. 393, 403-04 (1978) (arguing that law preserves privacy in part to deter wasteful attempts at concealment).

²⁵⁷ See Rebecca S. Eisenberg, *Proprietary Rights and the Norms of Science in Biotechnology Research*, 97 YALE L.J. 177, 193 (1987); Friedman et al., *supra* note 255, at 68.

²⁵⁸ Some investment in "reasonable" secrecy is encouraged by the law. See RESTATEMENT (SECOND) OF TORTS § 757 cmt. b (1965). This may be desirable as a signal to employees and others as to what constitutes a secret. See Edmund W. Kitch, *The Law and Economics of Rights in Valuable Information*, J. LEGAL STUD. 683, 698-99 (1976).

²⁵⁹ See Friedman et al., *supra* note 255, at 70.

every avenue for acquiring proprietary business information; it does not give an exclusionary right.²⁶⁰ Competitors may not acquire a trade secret by improper means—that is to say, by means that involve an investment in socially wasteful activity. But it is permissible for a competitor to independently develop the trade secret, or to reverse engineer the trade secret from products lawfully acquired.²⁶¹ Why should such exceptions be permitted; particularly the apparently wasteful independent development exception, which seems to encourage competitors to reinvent the wheel? Two justifications suggest themselves. First, these alternative means of acquiring the trade secret effectively cap the price of a license for a given trade secret. The owner of the trade secret can charge no more than it would cost to independently develop or reverse engineer the secret; were the owner to do so, potential licensees would opt for the cheaper alternatives.²⁶² Second, when competitors do opt for independent development or reverse engineering, these alternatives channel their investment into socially useful activity—either option develops productive technological or business expertise within the firm, rather than wasteful expertise in industrial espionage.²⁶³

Copyright law appears to entail selected legal structures analogous to those found in trade secrecy which may serve similar purposes.²⁶⁴ Copyright law by its nature allows independent development as a permissible alternative to unauthorized copying; by definition, if a work is independently developed it is not copied, and so does not infringe.²⁶⁵ Additionally, to the extent that copyright encompasses works that may be reverse engineered, the courts have carved out a fair use exception for copying in the course of reverse engineering. Several courts have held that incidental copying is permissible if necessary to extract public domain elements from a copyrighted work.²⁶⁶ As in the case of

²⁶⁰ See *id.* at 62.

²⁶¹ See RESTATEMENT OF TORTS § 757 cmt. b (1965); UNIFORM TRADE SECRETS ACT § 1 commentary, 14 U.L.A. 433 (1985).

²⁶² See, e.g., 12 ROGER M. MILGRIM, MILGRIM ON TRADE SECRETS § 6.05[2] (1991); Martin J. Adelman, *Property Rights Theory and Patent-Antitrust: The Role of Compulsory Licensing*, 52 N.Y.U. L. REV. 977, 981-82 (1977).

²⁶³ See Friedman et al., *supra* note 255, at 70.

²⁶⁴ See Gordon, *supra* note 68, at 856 n.13 (arguing that copyright, like trade secrecy, serves to deter wasteful over-investment in self-help).

²⁶⁵ See *Sheldon v. Metro-Goldwyn Pictures Corp.*, 81 F.2d 49, 54 (2d Cir. 1936), *cert. den.*, 298 U.S. 669 (1936) (“[I]f by some magic a man who had never known it were to compose anew Keats’s Ode on a Grecian Urn, he would be an ‘author’ . . .”).

²⁶⁶ See *Sega Enters. v. Accolade, Inc.*, 977 F.2d 1510 (9th Cir. 1992); *Atari Games Corp.*

trade secrecy, such legal standards will tend to cap the price a copyright holder can charge for a license—it cannot be more than the cost of independent development, or of reverse engineering in the case where copyright is serving as a deterrent to reverse engineering of non-copyrightable elements. Also, as in the case of trade secrecy, these alternatives will tend to channel competitive effort into socially useful activity, rather than slavish copying.

The addition of copyright management systems should not be permitted to change this incentive structure: neither technological nor legal protection of the copyrighted work should be perfect; instead, both should permit socially useful hacking.²⁶⁷ This result can be achieved by law already in place; specifically, the contributory infringement standard articulated by the Supreme Court in *Sony Corp. of America v. Universal City Studios, Inc.*²⁶⁸ There, the Supreme Court held that the production and sale of devices which may be used for illegal copying, but which have substantial non-infringing uses, does not constitute contributory infringement.²⁶⁹ The corollary to this principle is that production and sale of devices will be penalized as contributory infringement under copyright law.

v. Nintendo of Am., Inc., 975 F.2d 832 (Fed. Cir. 1992); see also Dennis S. Karjala, *Copyright Protection of Computer Documents, Reverse Engineering, and Professor Miller*, 19 U. DAYTON L. REV. 975 (1994); J.H. Reichmann, *Design Protection and the New Technologies: The United States Experience in a Transnational Perspective*, 19 U. BALT. L. REV. 6, 144 (1989) (noting that “copyright laws foster a built-in process of ‘reverse engineering’ that enables many copyrightable works to cluster around common themes or ideas”).

²⁶⁷ Curiously, proponents of copyright management argue that consumers are not entitled to access private documents, even to make fair use of them. See, e.g., *NII Protection Act of 1995: Joint Hearing Before the Subcommittee of Courts and Intellectual Property of the House Committee on the Judiciary and the Senate Committee on the Judiciary*, 104th Cong. (1995) (prepared statement of Marybeth Peters, Register of Copyrights) (analogizing copyright management protection to keeping a document locked in an office). This argument is directly analogous to a situation in trade secrecy: in the world of atoms, documents could be protected by restricting access until the author had a chance to profit from his exclusive possession. See Posner, *supra* note 256. If the document were published, however, distribution necessarily would make the document available, and copyright protection would be substituted for trade secrecy to ensure that the author would receive his profit. The quid pro quo for the commercial reward would be that the public would receive access. See Robert A. Kreiss, *Accessibility and Commercialization in Copyright Theory*, 43 UCLA L. REV. 1, 13-14 (1995). Content owners who draw the analogy to private documents apparently want to use technological barriers to both distribute their works and deny public access via technological barriers—in essence, simultaneously reaping the benefits of both copyright and trade secrecy without giving the public the quid pro quo of copyright.

²⁶⁸ 464 U.S. 417 (1984).

²⁶⁹ See *id.*

This standard, therefore, has the same effect as the “proper means” alternatives for acquiring a trade secret: channeling competitive efforts into socially useful activity. Under the *Sony* standard, development of technology that has no purpose but to facilitate infringement will be penalized as socially wasteful; but the standard will not discourage the development of technology that may have other social benefits, even if incidentally used to hack copyright management technology.

C. *Collective Rights Institutions*

An additional “self-help” supplement to rights management technology, also grounded in analogies to real property, is suggested by Professor Hardy in his discussion of “institutional or organizational” innovations.²⁷⁰ These types of innovations have been the focus of a recent and widely-cited commentary by Robert Merges, which rests in large part upon an analysis of collectives in the management of land.²⁷¹ Merges argues that such voluntary associations constitute a private “contract” into liability rules—that is, the members of such organizations agree to a set fee for use of their intellectual property. Merges cites examples of such private entities as ASCAP and BMI, organizations that license and distribute performance royalties for copyrighted music; the Harry Fox Agency, an organization that licenses and collects recording royalties for copyrighted music; and patent pools, organizations that cross-license patent rights in certain industries. According to Merges, the contractual liability rules of such private organizations, aimed at collecting voluntarily adopted fees, are superior to legislatively-mandated liability rules because the royalties are set, monitored, and revised by industry experts who have better knowledge of the market conditions in each industry.

Merges argues that strong property rights are necessary to the development of such organizations.²⁷² However, it is unclear how he arrives at this conclusion, given the characteristics of the various rights organizations that he surveys. It is enormously

²⁷⁰ See Hardy, *Property (and Copyright) in Cyberspace*, *supra* note 25, at 238.

²⁷¹ See Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations*, 84 CAL. L. REV. 1293 (1996); see also Rose, *supra* note 24, at 132 (advocating exploration of such “limited common property” regimes). Indeed, Hardy appears to have been influenced in his discussion by an early version of Merges’s analysis. See Hardy, *Property (and Copyright) in Cyberspace*, *supra* note 25, at 238-39 (citing Robert P. Merges, *Of Property Rules, Coase, and Intellectual Property*, 94 COLUM. L. REV. 2655 (1994)).

²⁷² See Merges, *supra* note 271, at 1296.

difficult to distill any credible general rule from Merges's survey of such organizations; the collectives have grown up under such a wide variety of circumstances that commonality seems more elusive than he acknowledges. Certainly, the necessity of strong property rules cannot be claimed as a common theme for the genesis of such organizations: some, such as ASCAP, have formed under legal regimes where a relatively undivided Calabresi/Melamed property is the central right; others, such as the Harry Fox Agency, have formed where a copyright compulsory license—a liability rule—is central; and still others, such as industrial “patent pools,” have formed under a regime of “blocking patents”—a divided property entitlement. Several of Merges's examples, such as fashion and screenwriting guilds, formed without the benefit of any entitlement rule—either property or liability—at all.²⁷³

If there is a common factor among Merges's examples, it may well be that “muddy” entitlements, whether of the property or liability persuasion, are linked to such organizations. Many of Merges's examples appear to have grown up in the shadow of muddy entitlement standards. This Article has already reviewed the muddy aspects of copyright entitlements, including the uncertainty of entitlements in fair use and originality. Patents are frequently cited as examples of “strong” property, yet patent entitlements frequently entail a good deal of muddiness, given that the scope of patent rights is determined by patent claims, which are subject to judicial interpretation.²⁷⁴ Patent claims are further muddied by legal standards such as the doctrine of equivalents, under which inventions containing elements “equivalent” to those described in the patent are held to infringe the claimed invention. What constitutes an “equivalent” is, of course, also a matter of judicial interpretation.

Muddy standards are similarly featured in many of the “new institutional” property examples upon which Merges draws. Merges makes much of private ordering in Southern California groundwater basin management, as described by Elinor Ostrom.²⁷⁵ The voluntary groundwater allocation organizations coalesced, we are told, as a result of the “vague” entitlements to usage under

²⁷³ See *id.* at 1368-69.

²⁷⁴ See *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996).

²⁷⁵ See ELINOR OSTROM, *GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION* (1990).

“hazy” state law principles of capture.²⁷⁶ In particular, the municipalities sought to avoid repeated litigation to clarify their rights, and so voluntarily formed water basin districts and associations that developed and enforced clear private rules for usage.²⁷⁷ This history accords well with Carol Rose’s suggestion that “muddy” entitlements are characteristic of the flexible community understandings that exist among members of close-knit or familial communities.²⁷⁸ Adopting “muddy” entitlements as formal rules among larger, diverse communities allows parties to reinstate some of the flexibility that would exist among those with shared social understandings.²⁷⁹

Consequently, it is not clear that Merges’s argument necessarily militates in favor of “clear” rights for intellectual property, or for cyberspace. Professor Hardy frets about the numerous special interest exceptions to the Copyright Act—in particular, the fair use exception, which he claims compromises the rights of an author. Hardy argues that such inroads on complete entitlements demonstrate a failure to fully privatize the commons, and so will lead to inefficiencies associated with group rights. He draws a specific analogy to the costs of groups reaching agreement on how to use land.²⁸⁰ Yet Merges’s argument suggests that muddy entitlements may foster the development of organizations which privately clarify the group entitlements.

Moreover, even when collective rights organizations arise to administer the disposition of digital property, it may be sensible to retain a “muddy” backdrop, even if parties have contractually clarified certain aspects of the entitlement. Merges correctly identifies such rights management organizations as an adjunct to rights management technology,²⁸¹ and muddy entitlements should be retained for the same reasons: dividing surplus, encouraging innovation, dampening strategic behavior, and generating socially beneficial externalities.

²⁷⁶ See Merges, *supra* note 271, at 1323.

²⁷⁷ See *id.*

²⁷⁸ See Rose, *supra* note 27, at 608-09.

²⁷⁹ See *id.*

²⁸⁰ See Hardy, *Property (and Copyright) in Cyberspace*, *supra* note 25, at 254-55. *But see* Carol Rose, *The Comedy of the Commons: Custom, Commerce, and Inherently Public Property*, 53 U. CHI. L. REV. 711 (1986) (arguing that group ownership is sometimes efficient).

²⁸¹ See Merges, *supra* note 271, at 1381.

CONCLUSION

This Article has attempted to show that a naive reliance upon bright-line property rules is unworkable for digital networks. Property entitlements, including “strong” property entitlements, undoubtedly play an important role in facilitating creativity, innovation, and trade on the Internet. However, the past development of property law, including intellectual property law, shows the variety of legal rules that may evolve in response to different transactional environments. We should therefore be suspicious of arguments that promulgate only one type of rule as desirable in every circumstance. The analysis here demonstrates that on-line transactional environments will be as varied as those found in real space, and will often be attended by high transaction costs. This indicates that in many situations, clear property entitlements may not be the only, or even the optimal, rule for fostering digital works. Just as in real space transactions, there will be a continuing role for “muddy” rules in cyberspace.