The Romance of the Public Domain

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Since Hardin, law and economics scholars have launched a crusade to expose the evil of the commons—the evil, that is, of not propertizing. Progressive legal scholars have responded in kind, exposing the perils of propertization. With the rise of the Information Age, the flashpoint debates about property have moved from land to information. The public domain is now the cause célèbre among progressive intellectual property and cyberlaw scholars, who extol the public domain as necessary for sustaining innovation. But scholars obscure the distributional consequences of the commons. They presume a landscape where every person can reap the riches found in the commons. This is the romance of the commons—the belief that because a resource is open to all by force of law, it will indeed be equally exploited by all. But in practice, differing circumstances—including knowledge, wealth, power, access, and ability—render some better able than others to exploit a commons.

We examine this romance through the lens of the global intellectual property regime in genetic resources and traditional knowledge. The Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) transformed a global public domain in information by propertizing the information resources of the West—from entertainment to technological advances—but leaving in the commons the information resources of

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the rest of the world, such as genetic resources and traditional knowledge. Just as the trope of the "romantic author" has served to bolster the property rights claims of the powerful, so too does the romance of the public domain. Resourcefully, the romantic public domain trope steps in exactly where the romantic author falters. Where genius cannot justify the property claims of corporations (because the knowledge pre-exists individual claims of authorship), the public domain can. We review real-world strategies for resolving the romance of the commons. Just as recognition of the tragedy of the commons is the central justification for private property, recognizing the romance of the commons may justify forms of property uncommon in Western legal traditions.

INTRODUCTION

Garrett Hardin famously invites us to "[p]icture a pasture open to all."[1] "It is to be expected," Hardin writes, "that each herdsman will try to keep as many cattle as possible on the commons."[2] On this logic, the men will overrun the commons with cattle, eventually destroying it. The gendered image of the herdsman central to the tragedy suggests our argument in this Article. As Hardin assumes, the herder is indeed likely to be a man. Men are more likely to own cattle than women. And we can offer other likely disparities: richer townspeople are more likely to raise cattle than poorer townspeople; herdsmen are likely to be able-bodied; the quantity of cattle one owns enables disproportionate exploitation.

Depictions of the commons typically elide these disparities. The tragedy of overuse (or the related tragedy of underuse) dominates the law's attention. Law presumes that producing efficiency is "*the* problem of the commons."[3] But the preoccupation with efficiency obscures the distributional consequences of the commons. Contemporary scholarship extolling the public domain presumes a landscape where each person can reap the riches found in the commons. This is the *romance* of the commons: the belief that because a resource is open to all by force of law, it will indeed be equally exploited by all. But, in practice, differing circumstances—including knowledge, wealth, power, and ability—render some better able than others to exploit a commons.

Since Hardin, law and economics scholars have launched a crusade to expose the evil of the commons—the evil, that is, of *not propertizing*. Progressive legal scholars have responded in kind, exposing the perils of

1. Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243, 1244 (1968).

2. *Id.*

3. Garrett Hardin, *The Problem of the Commons*, *in* PERSPECTIVES ON PROPERTY LAW 119 (Robert C. Ellickson et al. eds., 3d ed. 2002) (discussing "The Problem of the Commons" as the problem of establishing efficient use in the face of the tragic commons and the anticommons) (emphasis added).

propertization. From Margaret Jane Radin's pioneering work on commodification[4] to Rebecca Eisenberg's and Michael Heller's work on the anticommons,[5] such scholars have sharply rebuked the claim that property is the ultimate panacea. Yet another set of scholars—led by Robert Ellickson,[6] Elinor Ostrom,[7] and Carol Rose[8]—takes on the tragedy thesis itself. Observing real communities, they reveal that social norms can effectively govern the commons, averting the tragedy of over- or underuse. Trapped in this discourse framed by Hardin's law and economics prophecy, the literature regarding the commons remains impoverished, captured by a nearly single-minded concern for efficiency. While property talk routinely recognizes interests beyond efficiency,[9] commons talk remains trapped in the framework established by law and economics.[10]

Now, with the rise of the Information Age, the flashpoint debates about property have moved from land to information. In intellectual property, we have witnessed the emergence of a new *public domain movement*,[11] modeled self-consciously on the environmental movement, which seeks to protect a commons of information against the encroachment of private property. As we witness what scholars have labeled a new

4. Margaret Jane Radin, *Market-Inalienability*, 100 HARV. L. REV. 1849 (1987) (raising concerns about loss of personhood when markets coerce sale of personal attributes).

5. *See* Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCIENCE 698 (1998) (noting that extensive property rights can hamper innovation if costs of assembling rights necessary for new creation are prohibitive).

6. ROBERT C. ELLICKSON, ORDER WITHOUT LAW: HOW NEIGHBORS SETTLE DISPUTES (1991) (revealing social norms that displace law as a governing mechanism in close-knit communities).

7. ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION (1990) (highlighting mechanisms developed by groups to govern the commons in a sustainable manner).

8. Carol Rose, *The Comedy of the Commons: Custom, Commerce, and Inherently Public Property*, 53 U. CHI. L. REV. 711, 740-42 (1986) (observing that commons can be managed through customs even in absence of government).

9. Margaret Jane Radin, *Property and Personhood*, 34 STAN. L. REV. 957 (1982) (highlighting noneconomic interests in property related to human flourishing); Frank I. Michelman, *Ethics, Economics and the Law of Property*, *in* NOMOS XXIV: ETHICS, ECONOMICS, AND THE LAW 3, 7 (J. Roland Pennock & John W. Chapman eds., 1982) (arguing that a property regime might be preferred "for the sake of its expected distributional outcomes"). Indeed, even Hardin was concerned more with environmental stewardship than efficiency.

10. David Lange's work on the commons, however, has resisted this kind of reductionism, preferring instead a vision of the commons focused on freedom. *See* David Lange, *Reimagining the Public Domain*, 66 LAW & CONTEMP. PROBS. 463, 470 (2003) (offering affirmative, impressionistic conception of the public domain as "a place of refuge for creative expression . . . a place like home, where, when you go there, they have to take you in and let you dance").

11. The movement even has a slogan, "Free Culture," which replaces the earlier "Free Mickey!" as it sought to defeat the effort to extend the copyright term. *See* LAWRENCE LESSIG, FREE CULTURE: HOW BIG MEDIA USES TECHNOLOGY AND THE LAW TO LOCK DOWN CULTURE AND CONTROL CREATIVITY (2004).

"enclosure movement"[12] in the domain of ideas, the public domain has quickly ascended to the top of intellectual property scholars' agenda. The public domain is now the cause célèbre among progressive intellectual property and cyberlaw scholars. Scholars assembled at Duke Law School in November 2001 for a historic first meeting to plan the buttressing of the public domain against proprietary encroachments.[13] Stanford Law School recently helped to establish a project on the Creative Commons to expand free access to art, music, writing, and other creative endeavors.[14] Lured by the "siren call of the public domain,"[15] intellectual property and cyberlaw scholars are drawn to what they see as the "opposite of property."[16] We must protect the public domain, they argue, because it facilitates free speech and free access while at the same time sustaining innovation.

In the process, cyberlaw scholars have embraced, perhaps inadvertently, a kind of libertarianism for the Information Age. Their central focus on liberty values elides equality concerns, specifically the just distribution of wealth and cultural power.[17] We are sympathetic to the project to protect the public domain—indeed, many of our previous writings are similarly concerned about exclusive rights to make and control cultural meanings.[18] But we are also concerned that the increasingly binary tenor of current intellectual property debates—in which we must choose *either* intellectual property *or* the public domain—obscures other important interests, options, critiques, and claims for justice that are embedded in many new claims for property rights. By presuming that leaving information and ideas in the public domain enhances "semiotic democracy"—a world in which all people, not just the powerful, have the ability to make cultural meanings,[19] law

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12. James Boyle, *The Second Enclosure Movement and the Construction of the Public Domain*, 66 LAW & CONTEMP. PROBS. 33 (2003); Yochai Benkler, *Free as the Air to Common Use: First Amendment Constraints on Enclosure of the Public Domain*, 74 N.Y.U. L. REV. 354, 364-86 (1999).

13. James Boyle, *Foreword: The Opposite of Property?*, 66 LAW & CONTEMP. PROBS. 1 (2003).

14. *See* Creative Commons, *at* http://creativecommons.org (last visited June 11, 2004); *See also infra* Part III.A.3.

15. Anupam Chander, *The New, New Property*, 81 TEX. L. REV. 715, 797 (2003).

16. Boyle, *supra* note 13.

17. Rosemary Coombe's work is a notable exception. *See* ROSEMARY J. COOMBE, THE CULTURAL LIFE OF INTELLECTUAL PROPERTIES: AUTHORSHIP, APPROPRIATION, AND THE LAW (1998); Rosemary J. Coombe, Remarks at the Duke Law School Conference on the Public Domain (Nov. 9, 2001) (webcast available at http://www.law.duke.edu/pd/realcast.htm).

18. *See* Chander, *supra* note 15; Anupam Chander, *Whose Republic?*, 69 U. CHI. L. REV. 1479 (2002) (reviewing CASS SUNSTEIN, REPUBLIC.COM (2001)); Madhavi Sunder, *Piercing the Veil*, 112 YALE L.J. 1399 (2003); Madhavi Sunder, *Cultural Dissent*, 54 STAN. L. REV. 495 (2001); Madhavi Sunder, *Intellectual Property and Identity Politics: Playing With Fire*, 4 J. GENDER RACE & JUST. 69 (2000); Madhavi Sunder, *Authorship and Autonomy as Rites of Exclusion: The Intellectual Propertization of Free Speech in* Hurley v. Irish-American Gay, Lesbian and Bisexual Group of Boston, 49 STAN. L. REV. 143 (1996).

19. *See* JOHN FISKE, TELEVISION CULTURE 95, 236-39 (1987); *see also* William W. Fisher III, *Property and Contract on the Internet*, 73 CHI.-KENT L. REV. 1203, 1217 (1998) ("In an attractive society, all persons would be able to participate in the process of meaning-making. Instead of being

turns a blind eye to the fact that for centuries the public domain has been a source for exploiting the labor and bodies of the disempowered—namely, people of color, the poor, women, and people from the global South.

Native peoples once stood for the commons. But in the advent of an awareness of the valuable genetic and knowledge resources within native communities and lesser developed nations, the advocates for the public domain—and, in turn, propertization—have flipped. Now, corporations declare the trees and the shaman's lore to be the public domain, while indigenous peoples demand property rights in these resources.[20]

But romantic discourses of the public domain thwart the new claims for property emerging in the developing world and in Western indigenous communities. Focused more on form than function, the increasingly binary rhetoric of "intellectual property versus the public domain" deafens us to new claims by individuals who seek to restructure social and economic relations through property-like rights. The current habit of critiquing each and every new claim for property rights as an encroachment on the public domain carries some risks, as it may: (1) legitimate the current distribution of intellectual property rights, (2) mask how current constructions of the public domain disadvantage and subordinate indigenous and other disempowered groups globally, and (3) impair efforts by disempowered groups to claim themselves as subjects of property—that is, as autonomous individuals with constitutive personhood interests in property—rather than as mere objects, or someone else's property.[21]

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merely passive consumers of cultural artifacts produced by others, they would be producers, helping to shape the world of ideas and symbols in which they live.").

20. Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore, World Intellectual Property Organization [hereinafter WIPO Intergovernmental Committee], *Matters Concerning Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore—An Overview*, 4th Sess., Geneva, at para. 6, WIPO Doc. WIPO/GRTKF/IC/1/3 (Mar. 16, 2001) (noting that "the public domain status of [genetic resources, traditional knowledge, and folklore] has been called into question"); *see also* MICHAEL F. BROWN, WHO OWNS NATIVE CULTURE? (2003). For an account of the role of international institutions in creating this shift toward property, see Kal Raustiala & David G. Victor, *The Regime Complex for Plant Genetic Resources*, 58 INT'L ORG. 277 (2004).

21. *See* Margaret Jane Radin & Madhavi Sunder, *Foreword: The Subject and Object of Commodification*, *in* RETHINKING COMMODIFICATION (Martha M. Ertman & Joan C. Williams eds., forthcoming 2005).

22. *See* JAMES BOYLE, SHAMANS, SOFTWARE, AND SPLEENS: LAW AND THE CONSTRUCTION OF THE INFORMATION SOCIETY, at x-xiii (1996); Peter Jaszi, *On the Author Effect: Contemporary Copyright and Collective Creativity*, *in* THE CONSTRUCTION OF AUTHORSHIP: TEXTUAL APPROPRIATION IN LAW AND LITERATURE 29, 29-31 (Martha Woodmansee & Peter Jaszi eds., 1994); Keith Aoki, *(Intellectual) Property and Sovereignty: Notes Toward a Cultural Geography of Authorship*, 48 STAN. L. REV. 1293, 1333-38 (1996).

property claims of corporations because the knowledge pre-exists any ownership claims, the public domain can.

The commons, of course, is not just a feature of bucolic life. There are commons implicated even in our high technology lives. The computer operating system called Linux emerged in large part through a software commons within which people across the world added functionality, all without proprietary interest. Many now urge a commons in the electromagnetic spectrum, hoping to stimulate creative use of wireless technologies.[23] Genetic research builds upon a vast public domain of information.[24]

Central to this Article is the role of the commons in global contests over the control of traditional knowledge and genetic resources.[25] The commons serves as a treasure trove to be prospected for its commercial potential. In biotechnology, this reliance on the commons for building blocks of intellectual property is so standard that it even has a name: "bioprospecting."[26] Naturally occurring chemicals and compounds, genetic information in local flora and fauna, traditional medicines, and folklore may serve as the foundation for technological and cultural advances, especially in pharmacology, agriculture, and entertainment. Thus, the developing world's efforts to claim proprietary interests in traditional knowledge and genetic resources has, predictably, sparked resistance from corporations that wish to commercialize them at little or no cost. Advocates for the public domain, with their preference for free information, join hands with the corporations to keep traditional knowledge and genetic resource in the global commons. We suggest that this effort to keep information in the public domain must be appraised carefully.

In this regard, we can learn from the recent deromanticization of the movement for privatization. The romance of privatization has faded, its allure tarnished in the wake of the debacle of Russian mass privatization and failures in utility privatization.[27] Learning from these cases, scholars

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23. Yochai Benkler, *Some Economics of Wireless Communications*, 16 HARV. J.L. & TECH. 25, 28 (2002) (arguing for a commons in the electromagnetic spectrum implemented through mandatory sharing protocols adopted by all radio equipment).

24. *See* Robert P. Merges, *Property Rights Theory and the Commons: The Case of Scientific Research*, 13 SOC. PHIL. & POL'Y 145 (1996); Arti K. Rai & Rebecca S. Eisenberg, *Bayh-Dole Reform and the Progress of Biomedicine*, 66 LAW & CONTEMP. PROBS. 289 (2003).

25. We adopt the following working definitions for these terms: "Genetic resources" means "genetic material of actual or potential value," whereas "genetic material" is defined as "any material of plant, animal, microbial or other origin containing functional units of heredity." United Nations Conference on Environment and Development: Convention on Biological Diversity, June 5, 1992, 31 I.L.M. 818, 823-24 (entered into force Dec. 29, 1993) [hereinafter Convention on Biological Diversity].

26. *See infra* notes 169-83 and accompanying text.

27. Bernard Black et al., *Russian Privatization and Corporate Governance: What Went Wrong?*, 52 STAN. L. REV. 1731, 1798-99 (2000) (describing how to structure large scale privatization to control managerial self-dealing); Merritt B. Fox & Michael A. Heller, *Corporate Governance Lessons from Russian Enterprise Fiascoes*, 75 N.Y.U. L. REV. 1720, 1747-58 (2000) (describing how initial conditions of Russian privatization led to failed privatization).

have sought to restructure privatization to better accord with certain ideals. Where once even "dirty privatization" was better than leaving property in public hands, scholars no longer promote privatization by any means.[28] Given experience with the practice of privatization, scholars have recognized that "[p]rivatization is not enough. It matters who the owners are, what constraints on self-dealing they face, and the business climate they operate in."[29] We suggest an analogous move with respect to the romanticized public domain. We argue that leaving a resource in the public domain is not enough to satisfy societal ideals. It matters how that public domain is to be structured.

The global commons in traditional knowledge and genetic resources does not suffer from the familiar tragedy of overuse; unlike tangible resources, information resources are not exhausted by use. Instead, we argue that, like many other commons, this global commons in information works to the systematic advantage of a few identifiable constituencies. There are strategies available, however, to help countries restructure the distribution of benefits from biological information, especially the possibility of creating "limited commons property" regimes for such information.[30] In exploring such strategies, our goal is to help structure an international intellectual property order that holds the possibility of bettering the lot of the poorest in the world—the very same communities that have been historically and continuously disadvantaged by the imposition of external property norms.

Just as "property" is not susceptible to a uniform legal meaning, "public domain" is also a protean concept.[31] Scholars have defined it variously, from the *crumbs* theory—the public domain consists in the scraps left over after property rights have consumed their share[32]—to public domain as corrective to *market failure*,[33] and finally to public domain as *world's muse*. David Lange offers the most poetic vision for the latter theory of the public domain as "a place like home, where, when you go there,

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28. Black et al., *supra* note 27, at 1735 (noting that foreign advisors to Russia for its mass privatization program often "viewed dirty privatization as better than no privatization").

29. *Id.* at 1737.

30. *See* Carol M. Rose, *The Several Futures of Property: Of Cyberspace and Folk Tales, Emission Trades and Ecosystems*, 83 MINN. L. REV. 129 (1998) (proposing recognition and development of limited commons property regimes).

31. Boyle, *supra* note 12, at 68 ("Just as there are many 'properties,' so too there are many 'public domains.'"); Lange, *supra* note 10, at 463 ("In its usage to date, the term 'public domain' is elastic and inexact."); Pamela Samuelson, *Mapping the Digital Public Domain: Threats and Opportunities*, 66 LAW & CONTEMP. PROBS. 147, 148 (2003) ("The public domain is . . . different sizes at different times and in different countries.").

32. Lange, *supra* note 10, at 465 ("Like others at the time I suppose I had thought of the public domain mainly as whatever was left over after intellectual property had finished satisfying its appetite."); Jessica Litman, *The Public Domain*, 39 EMORY L.J. 965, 968 (1990) (public domain is a "commons that includes those aspects of copyrighted works which copyright does not protect.").

33. 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).

they have to take you in and let you dance."[34] Central to most definitions of the public domain is the notion that resources therein are available broadly for access and use. Just as property consists in a varying bundle of rights revolving around a central right to exclude,[35] the public domain consists in a varying bundle of rights revolving around the right to access and use. In addition, from Hardin to Ostrom, scholarship has assumed that such access and use cannot be conditioned on the payment of a substantial price. Accordingly, we offer the following definition:

> *Public domain*: Resources for which legal rights to access and use for free (or for nominal sums) are held broadly.[36]

Adopting such a capacious definition, it becomes unnecessary to distinguish public domain from "commons." Both terms have an intertwined past and an interrelated present. While the "public domain" often refers to resources to which there are rights of access shared among *all* people and "commons" often refers to resources shared among a defined group, it seems preferable to adopt more precise terminology to make this distinction. Universally-available resources can be labeled "global commons," while group-held resources can be described as "limited commons property."

The Article proceeds in three parts. Part I observes current scholars' romantic conception of the public domain and the distributional consequences of such a conception. The commons, we argue, is not always kind to commoners. Part II reviews the global inequity—not just in who benefits from intellectual property, but in *who pays* for the public domain—resulting from the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). Part III offers solutions for the problem of the inegalitarian commons. We survey real world practices—from *sui generis* biological heritage statutes, to African Union model laws, to Linux—and recognize them as strategies to reorder the exploitation of the commons. At the same time, these strategies make an effort to preserve certain normative aspects of the public domain, particularly concerning cultural dissent and exchange. In these strategies we identify new forms of property rights that may be held by those dispossessed of property—what we label "uncommon property." Where the tragedy of the commons is the central justification for private property, the recognition of the romance of the

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34. Lange, *supra* note 10, at 470.

35. The right to exclude others is "'one of the most essential sticks in the bundle of rights that are commonly characterized as property.'" Nollan v. California Coastal Comm'n, 483 U.S. 825, 831 (1987) (quoting Kaiser Aetna v. United States, 444 U.S. 164, 176 (1979)); *see also* Thomas W. Merrill, *Property and the Right to Exclude*, 77 NEB. L. REV. 730, 730 (1998) ("[T]he right to exclude others is more than just 'one of the most essential' constituents of property—it is the *sine qua non*.").

36. "Broadly" here could mean the six hundred people of a village or the six billion people of the world.

commons, we will suggest, may justify forms of property that have heretofore not been recognized in Western legal traditions.

I
MADE FOR EACH OTHER

Private property and the public domain are paired together in a perpetual dance.

Intellectual property scholars know this. Indeed, we can observe the intimate relation between private property and the public domain in the scholarship describing, and critiquing, the rise of what has come to be known as the "romantic author" in intellectual property law.[37] Over the last decade, critical scholars have trained their attention on a central figure in intellectual property: the author/inventor.[38] Exposing the romantic ideal underlying this figure—the notion of individual creative genius necessary to intellectual production—scholars show that the romantic ideal ignores the actual process of creation, where individuals often work within corporate settings, an audience collaborates with authors to infuse work with meanings, and authors draw upon earlier creations. Despite its flawed premise, the trope of the romantic author helps justify broad intellectual property rights.[39] But rushing to protect the romantic author often serves to promote the interests of corporate owners of intellectual property rather than the individual artists, authors, and creators themselves.

The contemporary public domain movement began as a response to the romantic author trope. Scholars recognized that the romantic author's clout, and the corresponding expansion of intellectual property rights, depended upon obscuring the existence of the public domain. As James Boyle succinctly asks, "Who needs a public domain if you can create out of nothing?"[40] In answer, scholars revealed the public domain as essential for

37. BOYLE, *supra* note 22; Keith Aoki, *(Intellectual) Property and Sovereignty: Notes Toward a Cultural Geography of Authorship*, 48 STAN. L. REV. 1293 (1996).

38. *See* sources cited *supra* note 22.

39. BOYLE, *supra* note 22, at 116 (noting that, because of the sympathy they elicit from decision makers, "authors tend to win" in the struggle for ownership). Dissenting from this view, Mark Lemley observes that "[i]t is certainly possible to find evidence of the rhetoric of authorship in copyright cases, but as an explanation for the nuances of copyright, trademark, or right-of-publicity cases, the concept falls well short of the mark." Mark A. Lemley, *Romantic Authorship and the Rhetoric of Property*, 75 TEX. L. REV. 873, 886 (1997) (citation omitted). But even if Lemley is correct that romantic authorship has limited explanatory force with respect to the nuances of intellectual property law, it still seems to form the basis for the public appeal for the expansion of intellectual property rights. The fight against Napster, for example, was explained as an effort to protect musicians, not as an effort to protect their recording labels. *See* Recording Industry Association of America, *More Recording Artists and Industry Leaders Speak Out Against Napster* (Apr. 11, 2000), *at* http://www.riaa.com/news/newsletter/press2000/041100.asp.

40. Boyle, *supra* note 12, at 52.

the process of creation and ultimately, propertization.[41] The new mantra of the movement exposed private property and the public domain as two sides of the same coin: innovation captured as private property *depends upon* the existence of a rich public domain. Taking up the utilitarian banner, intellectual property scholars argued that "innovation can suffer both from leaving too little and too much in the public domain."[42] Too many intellectual property rights raise the cost of access to some resource[43] and can create "choke points" on innovation.[44] Thus, scholars promoted the public domain as a key to efficient economic growth.[45]

The advent of cyberspace and digital technologies, which facilitate global sharing of cheap and perfect copies of information products, bolstered the appeal of the public domain in still other ways. Inspired by the possibilities of a better world in cyberspace, scholars dreamed of an intellectual utopia in which no keys or pass codes were required to access the fruits of the mind.[46] Similarly, Jamie Boyle has defined the public domain as "the material that is free for all to use and to build upon."[47] Cyberspace has helped to reveal not just the utility of the public domain for enhancing innovation, but also the public domain's centrality as an instrument for realizing the liberty values of robust speech and cultural participation.

But the nearly exclusive emphasis on utility and liberty values in this literature obscures important equality values. To be sure, many in the public domain movement care about the dispossessed. Indeed, they remind us that the movement to privatize the commons generally involved breaking down a more communal social order and concentrating wealth in the hands of the powerful.[48] But contemporary public domain scholars hold as their

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41. Jessica Litman has argued that the public domain "rescues" us from the romantic notion that individuals create out of thin air by furnishing "a crucial device to an otherwise unworkable system by reserving the raw material of authorship to the commons, thus leaving the raw material available for other authors to use." Litman, *supra* note 32, at 1023.

42. Boyle, *supra* note 13, at 26.

43. *Id*. at 29; *see also* Boyle, *supra* note 12, at 43 ("Every potential increase of protection . . . also raises the cost of, or reduces access to, the raw material from which you might have built those products.").

44. Boyle, *supra* note 13, at 29; *see also* Heller & Eisenberg, *supra* note 5.

45. *See, e.g.*, Litman, *supra* note 32, at 968 ("The public domain should be understood not as the realm of material that is undeserving of protection, but as a device that permits the rest of the system to work by leaving the raw material of authorship available for authors to use."). For a similar argument, see RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 47 (5th ed. 1998) ("[W]hile an increase in the scope of copyright protection will enhance an author's expected revenues from the sale or licensing of his own copyrights, it will also increase his cost of creating the works that he copyrights.").

46. *See* Lawrence Lessig, Commons and Code, Keynote Address at the Fordham Intellectual Property, Media & Entertainment Law Journal's Seventh Annual Symposium: First Amendment and the Media: Convergence—Necessary, Evil, or Both? The Legal, Economic, and Cultural Impacts of Mega Media Mergers (Feb. 9, 1999), *in* 9 FORDHAM INTELLECTUAL PROP. MEDIA & ENT. L.J. 405, 406 (1999). Jessica Litman has envisioned that "[t]he contents of the public domain may be mined by any member of the public." Litman, *supra* note 32, at 975.

47. Boyle, *supra* note 13, at 1.

48. *See, e.g.*, Boyle, *supra* note 12, at 35.

paradigm figure the "commoner" who easily appropriates popular art and innovations for his or her own purposes.[49] This conception fails to acknowledge disparities in the ability of individuals to exercise their freedoms.[50]

The public domain movement leaves the common person to the mercy of an unregulated marketplace where she must struggle to realize her rights. Public domain advocates seem to accept that because a resource is open to all by force of law, that resource will indeed be exploited by all. In practice, however, differing circumstances—including knowledge, wealth, power, and ability—render some better able than others to exploit a commons. We describe this popular scholarly conception of the commons as "romantic"; the conception adopts the idealism assimilated into Romantic aesthetics.[51] It is celebratory, even euphoric, about the emancipatory potential of the commons. But it is also naïve, idealistic, and removed from reality. Even among those who accept the ability of the market to create efficient results, very few claim that the fruits of the market are distributed equally.

Global Internet traffic to sites hosting publicly available genomic code as depicted in Figure 1 vividly illustrates the asymmetric exploitation of the commons. The United States, the European Union, and Japan have each set up repositories of genetic sequence data; information from these databases can be downloaded by anyone connected to the Internet. The American database, known as GenBank, seeks to "provide and encourage access within the scientific community to the most up to date and comprehensive DNA sequence information."[52] With the construction of these databases, researchers expected "genetic information to become a global resource, shared equally."[53]

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49. Boyle, *supra* note 13, at 17 (praising the endeavor of artists such as Negativland, who appropriate from others by reworking material produced by the culture industries).

50. Even where commons scholars recognize heterogeneity among the appropriators of the commons, they do so only to see whether that heterogeneity threatens the emergence of a sustainable, self-governing commons. Furthermore, in seeking to validate the ability of a self-governing commons to escape a tragic ending, such scholars typically neglect the power differentials within the relevant community. *See, e.g.*, Elinor Ostrom, *Reformulating the Commons*, *in* PROTECTING THE COMMONS: A FRAMEWORK FOR RESOURCE MANAGEMENT IN THE AMERICAS 17 (Joanna Burger et al. eds., 2001).

51. *See generally* DUNCAN WU, ROMANTICISM: AN ANTHOLOGY (2d ed. 1998).

52. Nat'l Ctr. for Biotechnology Info., *GenBank Overview*, *at* http://www.ncbi.nlm.nih.gov/Genbank/GenbankOverview.html (revised July 8, 2003).

53. Rodrigo Martinez et al., *The Geography of the Genome*, WIRED, June 2003, at 160.

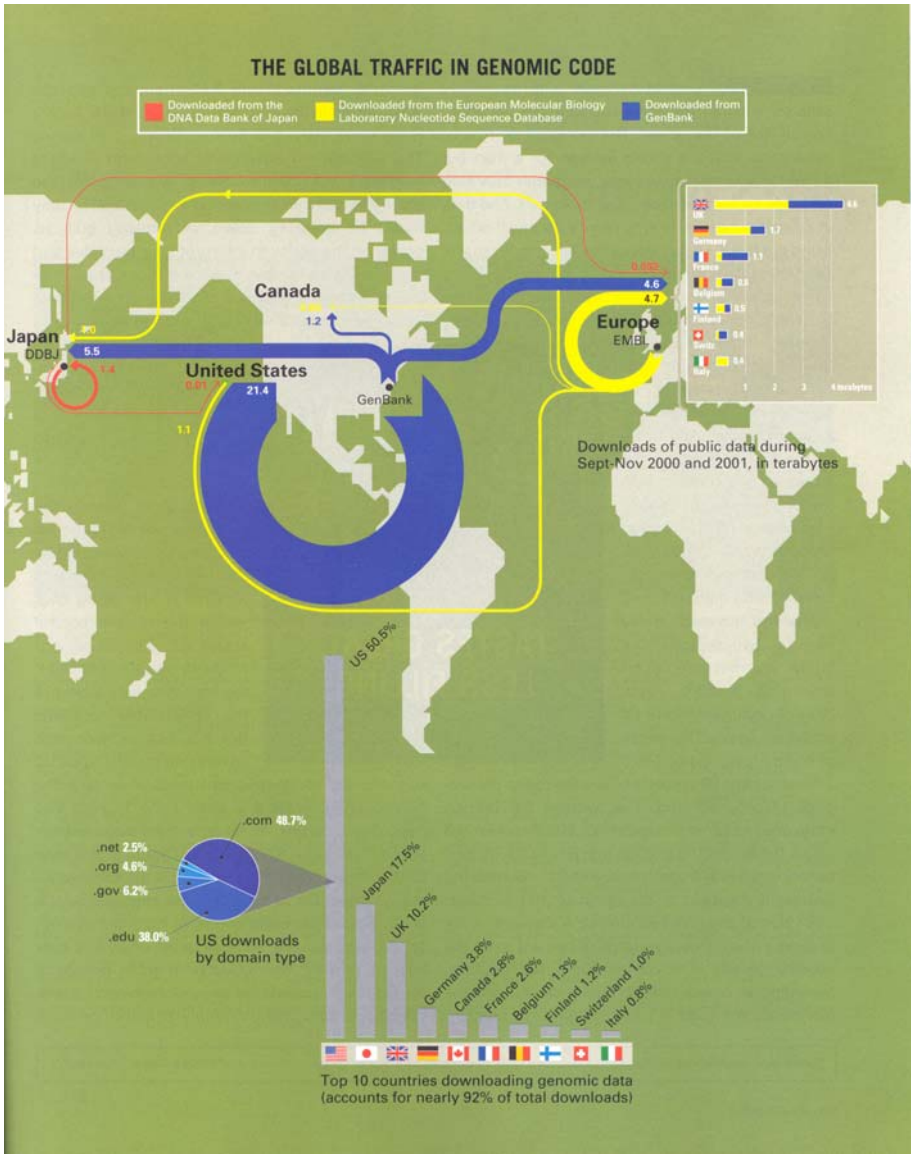

Figure 1. The Global Traffic in Genomic Code (Wired June 2003). Reprinted with the permission of Juan Enriquez and Rodrigo Martinez.

But a study by the Harvard Business School Life Sciences Project demonstrates that, instead of equality, dramatic disparities exist in the exploitation of this global commons.[54] Half of the data downloaded from these databases was downloaded by Americans.[55] With the exception of

54. *Id.*
55. *Id.*

Japan, no country in Africa, Latin America, or Asia downloaded more than one percent of this information.[56] And even within the United States there exist notable disparities: users from .com domains (i.e., private users) downloaded about half of all data from GenBank.[57] As the authors of the study conclude:

> It turns out a new world hierarchy is developing, one that separates those nations and regions that are bioliterate from those that are bio-illiterate. This is the world of DNA space, populated by a self-selecting few who have chosen to participate in the new technology revolution. The price of admission: the ability to produce, read, or translate DNA. This means that even as biodata begins to drive industries from agribusiness to computing, cosmetics to chemical manufacturing, few nations have the skills required to develop, access, and use it.[58]

None of this suggests that a commons approach to DNA sequencing is inherently misguided. There is much to be gained from the free flow of such information. However, to the extent that we adopt commons approaches, we need to pay attention to their distributional consequences.

The binary rhetoric of *intellectual property versus the public domain* masks the ways in which the commons often functions more in the interests of traditional property owners than in the interests of commoners. In general, there is a dialectical relationship between the public domain and intellectual property: intellectual property thrives in the presence of a robust public domain from which it freely borrows, and the public domain grows as information passes, over time, out of intellectual property. To this end, the fashionable understanding of the public domain as "the opposite of property" is misleading. The binary framework suggests that, normatively, the public domain stands in opposition to intellectual property—that the public domain is a bulwark against propertization and an alternative to intellectual property. But in fact, the public domain is essential to our private property system because it offers a sphere of free works upon which capitalists can draw without either seeking consent or drawing liability. As lawyers will recall from their first year property course, the Lockean labor theory of property starts with the proposition that "every man has a property in his own person," from which it follows that "[t]he labour of his body, and the work of his hands . . . are properly his."[59] According to Locke, a person who labors upon resources that are either unowned or "held in common" has a natural property right to the fruits of his or her

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56. *Id.*

57. *Id.* Of course, a user's .com IP address is a very imperfect proxy for the commercial nature of a particular use.

58. *Id.*

59. THE TRADITION OF FREEDOM: JOHN LOCKE, ADAM SMITH, THE FEDERALIST, 11 (Milton Mayer ed., 1957).

efforts—and the state has a duty to respect and enforce that natural right. Scholars debate whether Locke's theory is applicable to the field of intellectual property, where the underlying raw materials (facts and concepts) appear more conducive to being held in common than real property.[60] But in either case, Locke's labor theory of property *depends upon* the existence of a commons or public domain of resources from which individuals can freely take and appropriate.[61]

The Hegelian "personality," or "will," theory is similarly premised upon the existence of a public domain. According to Hegel, everything is in the public domain until an individual endeavors to put her "will" into an object and asserts ownership over it.[62] In *The Philosophy of Right*, Hegel asserts "the absolute right of appropriation which man has over all 'things.'"[63] For Hegel, possession or occupancy is the basis of property rights. But possession is not physical as much as metaphysical—the important issue is whether one's will has possessed the external object.[64] Possession satisfies man's "natural need, impulse, and caprice" to make something his own.[65] Thus, a thriving commons is instrumental for Hegel, serving as a symbiote of private property.

Carol Rose points out a similar dynamic of interdependence in her discussions of *res publicae* property, or property belonging to the public and open to the public by operation of law.[66] The classic examples of *res publicae* property are public roadways and other lanes of transportation and communication—from harbors, ports, and bridges to, in the Information Age, the Internet.[67] While theoretically serving the rich and poor alike, Rose reminds us that roadways and other avenues of public transportation and communication were instrumental to the first enclosure

60. *Compare* Fisher, *supra* note 19, at 1213 (characterizing Lockean labor theory as applicable to intellectual property law), *with* Seana Valentine Shriffrin, *Lockean Arguments for Private Intellectual Property*, *in* NEW ESSAYS IN THE LEGAL AND POLITICAL THEORY OF PROPERTY 138 (Stephen R. Munzer ed., 2001) (arguing that Locke's theory does not justify intellectual property).

61. On the application of the "Lockean proviso" to intellectual property, requiring appropriators to leave "enough, and as good" in the common, see generally Wendy J. Gordon, *A Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property*, 102 YALE L.J. 1533 (1993), and Jeremy Waldron, *From Authors to Copiers: Individual Rights and Social Values in Intellectual Property*, 68 U. CHI.-KENT L. REV. 841 (1993).

62. GEORG WILHELM FRIEDRICH HEGEL, PHILOSOPHY OF RIGHT (T.M. Knox ed. & trans., Oxford Univ. Press 1952) (1821).

63. *Id.* at 41.

64. *Id.* at 43 ("[A]s a person, I possess my life and my body, like other things, only in so far as my will is in them."). For example, at least as interpreted by law, Native Americans lost their lands less through physical conquest, and more by a mere assertion of colonial "will." *See, e.g.*, Johnson v. M'Intosh, 21 U.S. (8 Wheat.) 543 (1823); Carol M. Rose, *Possession as the Origin of Property*, 52 U. CHI. L. REV. 73 (1985).

65. *Id.* at 42.

66. Carol M. Rose, *Romans, Roads, and Romantic Creators: Traditions of Public Property in the Information Age*, 66 LAW & CONTEMP. PROBS. 89, 96 (2003).

67. *Id.*

movement.[68] Open roadways allow for free and unfettered trade; they connect more of the world's peoples together, thereby enlarging the potential markets that private property can exploit.[69] *Public* roads and open systems of transportation make *private* property more valuable.[70] The concepts of public and private property are "by no means antagonistic."[71] Rose reminds us: "[I]t is a mistake to suppose that the public domain and private property are independent realms. Instead, the two are intimately intertwined, both historically and economically."[72]

Progressive scholars' nearly exclusive fixation on responding to the tragedy thesis may in part explain their sanguine portrayal of the public domain. Concerned that "[w]e seem to be shifting from Brandeis's assumption that the 'noblest of human productions are free as the air to common use' to the assumption that any commons is inefficient, if not tragic,"[73] public domain scholars have rebelled against economists by singing the praises of the commons. They argue that the commons is not inefficient, that it is not without law, and that too much property can create a problem of the anticommons.[74] The defensive nature of much of the public domain scholarship has left little room for a discourse that goes beyond the concern for efficiency. But the public domain raises important issues of distributive justice that are obscured by a discourse captured in the norms of law and economics.

Worse still, the current discourse frustrates efforts to correct the imbalance in the public domain, such as the innovations we explore in Part III. The discourse in incentives, for example, suggests that folklore and traditional knowledge must remain in the public domain. The same arguments made by the public domain advocates—that intellectual property rights make creation too expensive and create "choke points" on innovation—can be voiced by Big Pharma and multinational agricultural enterprises against proposed property rights in traditional knowledge and genetic resources: added costs may dissuade discoveries that help people. New claims for property rights in traditional knowledge and genetic resources are also dismissed based on liberty grounds: property in ideas, stories, and naturally occurring flora and fauna conflict with firmly embedded notions of free speech and access.[75] Finally, the intellectual

68. *Id.* at 101 ("[T]he enhancement of the *public* domain of communications itself has been deeply implicated in the efforts toward *private* enclosure.") (emphasis in original).

69. *Id*. at 97-98.

70. *Id*. at 100 (observing that idea of public property "works hand in glove with a regime in which most resources are the subject of private property").

71. *Id*. at 99; *see also id.* at 103 (writing that the public domain "is not a concept that is hostile to private property").

72. *Id*. at 101-02.

73. Boyle, *supra* note 12, at 40.

74. *See supra* notes 5-8 and accompanying text.

75. BROWN, *supra* note 20.

property versus public domain binary elides the promise of hybrid property/commons forms—what we call "uncommon property" in Part III.

But recognizing the structural relationship between intellectual property and the public domain—that they are made for each other—illuminates how the public domain often functions in service of property, not in opposition to it. In the next section we explore how the commons preserved by TRIPS facilitates the current enclosure movement, just as the transportation system facilitated the first enclosure movement. From the corporation's standpoint, the timing of this new romance could not be more perfect. As we will show, the public domain steps in just where the romantic author ceases to deliver property rights to the powerful. The romantic author cannot justify corporate control over these important, global information resources, but the romantic public domain can. The romantic public domain serves to protect free, commercial access to that information—regardless of others' prior proprietary and moral claims.

II
WHO PAYS FOR THE PUBLIC DOMAIN?

In 1848, the Great Mahele established fee simple rights in Hawaiian land, dividing that land among the king and chiefs.[76] Two years later, a statute granted the common people who worked the land the right to apply for title.[77] At the same time, the ban on the sale of land to foreigners was lifted in order to attract foreign capital.[78] The combination of the establishment of Western-style property rights and the sanction of sales to foreigners had a marked result on land distribution: "The land fairly quickly passed out of the hands of both [chiefs] and [commoners], reducing many to the status of landless laborers."[79] Relatively few commoners acquired title to the land in part due to their unfamiliarity with this new system of land tenure and the difficulty of filing claims and surveying land.[80] By 1896, whites owned 57% of the land area generating taxes, and Native Hawaiians owned just 14%.[81] Today, many descendants of the native Hawaiians see the move from more communal to more private property tenure as a key to the impoverishment of their forbearers. The Mahele land division was crucial to the project of colonizing Hawaii.

For many in the developing world, TRIPS—the Agreement on Trade Related Aspects of Intellectual Property Rights[82]—is today's Great

76. SALLY ENGLE MERRY, COLONIZING HAWAI'I: THE CULTURAL POWER OF LAW 93 (2000).
77. *Id.* at 93-94.
78. *Id.* at 94.
79. *Id.* at 95.
80. *Id.* at 94.
81. *Id.*
82. Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, art. 67, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, LEGAL INSTRUMENTS—

Mahele. Like the Mahele, TRIPS establishes both Western property rights and the right of foreigners to own property. To establish a property regime, TRIPS requires substantial standards of protection for intellectual property in all member states. To enable foreign ownership, TRIPS imposes national treatment obligations, requiring states to treat foreigners as equals of their own citizens. This cocktail of robust private property rights and foreign access thereto is leading to a steady transfer of the "ownership" of intellectual "products" from the developing world to the developed world.[83]

Indeed, the numbers may be more dramatic than those resulting from the Great Mahele. A 1974 United Nations study concluded that 84% of the patents granted in developing nations were held by foreigners.[84] Such disparity continues: In Sub-Saharan Africa (excluding South Africa), resident Africans received thirty-five patents in 1998, while nonresident foreigners received 741.[85] In 2001, persons from developing nations received less than 1% of patents granted in the United States.[86] Between 1999 and 2001, persons from developing nations accounted for less than two percent of patent applications received under the international system of the Patent Cooperation Treaty.[87]

Part of this story is quite familiar. It is well understood that the international legal regime for intellectual property currently favors the Western world.[88] But the role of the commons in creating and preserving global inequality is less remarked upon. Our contribution to this story is to disclose what TRIPS has deliberately left *un*enclosed. TRIPS has upset the balance in the global public domain. Prior to TRIPS, both West and East effectively benefited from a public domain in the other's inventions and

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RESULTS OF THE URUGUAY ROUND vol. 31, 33 I.L.M. 81 (1984) [hereinafter TRIPS]. For an overview of TRIPS, see J.H. Reichman, *Universal Minimum Standards of Intellectual Property Protection under the TRIPS Component of the WTO Agreement*, 91 INT'L LAW. 345 (1995).

83. The text of the TRIPS treaty organizes three categories of development status: "developed," "developing," and "least developed" countries. TRIPS, *supra* note 82. We use the term "developing" to refer to the latter two categories.

84. A. Samuel Oddi, *The International Patent System and Third World Development: Reality or Myth?*, 1987 DUKE L.J. 831, 843 n.61.

85. COMMISSION ON INTELLECTUAL PROPERTY RIGHTS, INTEGRATING INTELLECTUAL PROPERTY RIGHTS AND DEVELOPMENT POLICY 22 (2002), http://www.iprcommission.org/graphic/documents/final_report.htm [hereinafter IPR COMMISSION REPORT]. In the United States, by contrast, the corresponding figures for residents and nonresidents in 1998 were 80,292 and 67,228, an almost equal division of patent holders between the U.S. and the rest of the world. *Id.*

86. *Id.* at 12. For a breakdown of United States patents by country of origin, see U.S. PATENT & TRADEMARK OFFICE, PATENT COUNTS BY COUNTRY/STATE AND YEAR, JANUARY 1, 1977 - DECEMBER. 31, 2001 (2002), *at* http://www.uspto.gov/web/offices/ac/ido/oeip/taf/cst_all.pdf (last visited Sept. 2, 2004).

87. IPR COMMISSION REPORT, *supra* note 85, at 12.

88. *See* WORLD BANK, GLOBAL ECONOMIC PROSPECTS AND THE DEVELOPING COUNTRIES 133 tbl.5.1 (2002) (providing data that illustrates imbalance in favor of the Western world), http://www.worldbank.org/prospects/gep2002/gep2002complete.pdf (last visited Sept. 2, 2004).

expressions—the West, because the East did not formally protect its knowledge, and the East, because international intellectual property laws were weak and ineffective at protecting property across borders.

Medicines and pesticides do not usually spring divinely from the heads of pharmaceutical and agricultural company scientists. Companies often seek inspiration both in nature and in the knowledge developed in traditional communities, leading them to distant lands and peoples. Even a drug as commonplace as aspirin derives from the active ingredient in willow bark, salicin.[89] Indeed, aspirin is named in part for the spirea plant, which yields salicin.[90] In medicine, this search for inspiration even justifies a field, ethnopharmacology, with its own journal founded in 1979.[91] The field is premised on the belief that "[e]arly people confronted with illness and disease, discovered a wealth of useful therapeutic agents in the plant and animal kingdoms."[92] The editors of the *Journal of Ethnopharmacology* note that "[m]any valuable drugs of today (e.g., atropine, ephedrine, tubocurarine, digoxin, reserpine) came into use through the study of indigenous remedies."[93] Medicinal or agricultural innovations, held as intellectual property, often rely upon knowledge and genetic resources in the public domain.

The neem controversy offers one example of this process.[94] Indigenous to India, the neem tree is known in Sanskrit as "sarva-róga nívarini" or "curer of all ailments."[95] The Sanskrit name suggests the myriad applications of the products of the neem tree; traditional uses include "an almost ridiculous variety of pesticidal, agricultural, medicinal, contraceptive, cosmetic and dental applications."[96] In the 1980s, various Western countries began patenting applications of neem extracts.[97] The neem incident demonstrates that the problem of the exploitation of traditional knowledge and genetic information predates TRIPS. Indeed, TRIPS would not

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89. Bayer Aspirin, *100 Years of Aspirin*, *at* http://www.bayeraspirin.com/questions/hundred_aspirin.htm (last visited Apr. 8, 2004).

90. Folk medicine has long employed this ingredient; as far back as 400 B.C., Hippocrates prescribed willow bark as a pain reliever in his medical tracts.

91. For a description of the *Journal of Ethnopharmacology*, see Elsevier, *at* http://authors.elsevier.com/journaldetail.html?PubID=506035&Precis=DES (last visited Aug. , 2004).

92. *Id.*

93. *Id.*

94. Contrary to the dynamics of the neem patents, the editors of the *Journal of Ethnopharmacology* "[r]ecogniz[e] the sovereign rights of States over their natural resources," and observe that "ethnopharmacologists are particularly concerned with local people's rights to further use and develop their autochthonous resources." *Id.* at 91.

95. Shayana Kadidal, *Subject-Matter Imperialism? Biodiversity, Foreign Prior Art and the Neem Patent Controversy*, 37 IDEA 371, 371 (1997) (internal italics omitted).

96. *Id.* at 372-73 (citations omitted).

97. VANDANA SHIVA ET AL., THE ENCLOSURE AND RECOVERY OF THE COMMONS: BIODIVERSITY, INDIGENOUS KNOWLEDGE AND INTELLECTUAL PROPERTY RIGHTS 47-50 (1997) (listing some of the U.S. patents on neem).

not have affected the above account. Nor can TRIPS be held responsible for the wide disparity in patents obtained by persons in developing versus developed states.[98]

But while the neem incident offers an example of the Western world exploiting intellectual products of the East and South, we must recognize that the East and South also exploit the intellectual products of the West. Computer software, Disney films, and pharmaceutical products developed in the West have long been copied and commercialized in the developing world, often without any flow of royalties. The Western pharmaceutical giant GlaxoSmithKline, for example, alleged that it lost some $50 million in potential sales of its patented ulcer-treatment drug Tagamet because of local generic copying in Argentina and other developing countries.[99]

Developed states have, of course, long sought to thwart such copying. Copyright and patent conventions have existed for more than a century. The Paris Convention for the Protection of Industrial Property of 1883[100] and the Berne Convention for the Protection of Literary and Artistic Works of 1886,[101] both administered by the World Intellectual Property Organization (WIPO),[102] promised intellectual property holders some international protections. But for the most part, despite widespread accession, these systems of protection under the aegis of WIPO proved ineffective in practice. Developing states often failed to uphold their obligations.[103] Equally important, the copyright and patent conventions did not mandate high levels of minimum protection for intellectual property, requiring only "rudimentary" standards for patentable inventions.[104] Finally, the systems provided neither effective domestic nor international dispute resolution mechanisms for rights holders to redress violations.

The result was that, from the perspective of the Argentine drug manufacturers, the formula for Tagamet was effectively in the public domain.

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98. *See supra* notes 84-87 and accompanying text. Assemblies of the Member States of WIPO, *The Impact of the International Patent System on Developing Countries: A Study by Getachew Mengistie*, Thirty-Ninth Series of Meetings, Geneva, at para. 1.1.2, WIPO Doc. No. A/39/13 Add.1, 6 (Aug. 15, 2003) ("In developing countries, the proportion of patent grants to foreigners tends to be much higher than patents granted to their own nationals.")

99. *See* Oddi, *supra* note 84, at 845.

100. Paris Convention for the Protection of Industrial Property, Mar. 20, 1883, 13 U.S.T. 2, 828 U.N.T.S. 107.

101. Berne Convention for the Protection of Literary and Artistic Works, Sept. 9, 1886, 102 Stat. 2853, 828 U.N.T.S. 221.

102. For a discussion of the role of these conventions and of WIPO on international intellectual property protection, see Lawrence R. Helfer, *Adjudicating Copyright Claims Under the TRIPS Agreement: The Case for a European Human Rights Analogy*, 39 HARV. INT'L L.J. 357, 366-67 (1998).

103. For example, at crucial times in its own history, the United States ignored the intellectual property claims of foreign states as it freely appropriated from the store of foreign creativity and knowledge. *Cf.* IPR COMMISSION REPORT, *supra* note 85, at 18.

104. J. H. Reichman, *Universal Minimum Standards of Intellectual Property Protection Under the TRIPs Component of the WTO Agreement*, *in* INTELLECTUAL PROPERTY AND INTERNATIONAL TRADE: THE TRIPS AGREEMENT 21, 29 (Carlos M. Correa & Abdulqawi A. Yusuf eds., 1998).

Generic drug manufacture has flourished in large developing countries, as has copying of other inventions.[105] This reflects a system that has been in place for many decades; the international regime governing intellectual property has been effectively one of rampant exploitation of knowledge developed in all corners of the world.

TRIPS changed this. In place of an international commons where all intellectual products were available for exploitation by all—or at least exploitation by people outside the country of origin—TRIPS mandated strict protections for intellectual property throughout all member states.[106] Developing countries initially resisted the linkage of intellectual property to trade. During the Uruguay Round trade negotiations, the developing states sought to permit maximum flexibility on the part of each state to determine the scope of protection that intellectual products might receive.[107] The developing states lost this battle: TRIPS requires a robust set of minimum standards for intellectual property. The developing countries were, however, given transition periods during which to implement most of their obligations.[108]

That TRIPS would require significant changes in developing countries became clear soon after the birth of the World Trade Organization. The very first dispute brought under TRIPS was a claim by the United States against India, classified as a developing country under the treaty,[109] for violating its obligations to provide certain patent protections.[110] Even though TRIPS entitled developing countries to extra time in which to implement some of their treaty obligations, several measures were required immediately. The United States accused India of failing to provide a mailbox system in which patents could be filed to establish an order of priority for the time when the law permitted full patentability.[111] In addition, the United States accused India of failing to offer exclusive marketing rights to the foreign patent holder. The dispute resolution body's report in favor of the

105. Martin J. Adelman & Sonia Baldia, *Prospects and Limits of the Patent Provision in the TRIPS Agreement: The Case of India*, 29 VAND. J. TRANSNAT'L L. 507, 510, 524-32 (1996) (describing how the lack of pharmaceutical patent protection in developing countries like India enabled developing countries to take advantage of technology developed elsewhere).

106. TRIPS, *supra* note 82, at arts. 9-40.

107. CHRISTOPHER MAY, A GLOBAL POLITICAL ECONOMY OF INTELLECTUAL PROPERTY RIGHTS 87 (2000).

108. TRIPS, *supra* note 82, at arts. 65-66; *see also* World Trade Organization, Press Release, WTO Council approves LDC decision with additional waiver, http://www.wto.org/english/news_e/pres02_e/pr301_e.htm (providing for an additional waiver for obligations of least developed countries until January 1, 2016).

109. *See supra* note 83 for a description of classification system.

110. WTO Appellate Body Report on TRIPS: India—Patent Protection for Pharmaceutical and Agricultural Chemical Products, AB-1997-5, WTO Doc. No. WT/DS50/AB/R (Dec. 19, 1997), http://www.wto.org/english/tratop_e/dispu_e/ab_reports_e.htm.

111. *Id.*

United States, followed by India's subsequent amendment of its laws to conform to its obligations, demonstrated the binding power of TRIPS.

With the advent of TRIPS, the global commons of intellectual products has been radically transformed. For the developing world, the intellectual products of the developed world are to be firmly protected, on pain of loss of trade privileges. Argentina, for example, can no longer fearlessly snub Western pharmaceutical companies. But while TRIPS may make "fair followers" out of "free riders" in the developing world, [112] it leaves the developed world free to exploit the efforts and resources of the developing world, where the global commons of intellectual products remains intact. Because traditional knowledge and genetic resources in the developing world are unpatentable, at least in their raw state, such knowledge and resources remain open to exploitation.[113]

Thus, the public domain in traditional knowledge and genetic resources still remains, post-TRIPS. And this public domain is bound to be exploited asymmetrically. Why cannot companies in the developing world exploit such resources equally with companies in the developed world? After all, a company in Mumbai is likely to be more familiar with the traditional Ayurvedic system of medicine and local flora than a company in Switzerland.

Local knowledge notwithstanding, there are a number of reasons that such a disparity will be likely to obtain:

- Limited local opportunities for commercialization. Because of the limited consumer purchasing power in domestic markets, companies in the developing world often find it difficult to justify the extensive investment in research and development required to transform traditional knowledge and genetic resources into patentable pharmaceutical or agricultural products. In countries such as India, Nigeria, and Ecuador, with 2002 Gross National Income per capita averaging $480, $290, and $1,450 respectively,[114] the domestic consumer base cannot afford the drug prices charged to Western publics. Here, India and Nigeria have an advantage to some extent over Ecuador because they at least have large potential domestic consumer bases, with populations of 1,032 million,

112. J. H. Reichman, *From Free Riders to Fair Followers: Global Competition Under the TRIPS Agreement*, 29 N.Y.U. J. INT'L L. & POL. 11, 16 (1996-97) (asserting that, with the perpetuation of the protectionist trend in developed countries, developing countries can create a competitive edge by adopting a pro-competitive strategy in implementing the minimum standards of TRIPS to become "fair followers in the worldwide quest for technical innovation").

113. The same is true, of course, of traditional knowledge and genetic resources in the developed world, but given their limited reach and resources it is unlikely that companies in the developing world would be the first to exploit such knowledge and resources.

114. WORLD DEVELOPMENT REPORT 2004: MAKING SERVICES WORK FOR POOR PEOPLE 252 (2003).

130 million, and 13 million, respectively.[115] But even so, how much could a Bangladeshi company, for instance, hope to recover even from its vast domestic population of 133 million from the sale of a drug it innovated, given an average GDP per capita of $360?[116]

- Lack of extensive public investment in research. In advanced industrialized states, government-funded research programs at universities and research institutes support local companies. Governmental policy often mandates programs of technology transfer from public institutions to local enterprise. Developing nations generally do not have such extensive, publicly funded research and development programs.
- Capital constraints. Weak internal capital markets across the developing world make the process of raising capital quite expensive. Given the large capital investments needed to patent pharmaceutical and agricultural products and the long time frame within which profits from the investment can be realized, high interest rates make companies in developing countries less competitive. Even where the company seeks funding through the international credit markets, it is likely to face high interest rates because rates for corporate borrowing are generally tied to those for their home state (corporate risk is thought to include sovereign risk). The fact that borrowing is quite dear, domestically and internationally, makes capital-intensive activity difficult to undertake.
- Unfamiliarity. Companies in WTO Member States that are making agricultural and pharmaceutical products patentable only under the coercive force of TRIPS will not, as a matter of course, be as familiar with the patenting process for such products as are Western companies, who have long enjoyed the right to patent such products. The unfamiliarity of native Hawaiians with Western real property systems, as we have seen, disadvantaged them when it came to claiming their rights when such systems were introduced.[117] Even in the United States, patent lawyers, universities, and corporations expend significant resources to train scientists to patent inventions. Asserting exclusive rights to invention does not come naturally.

It may be offered that companies in developing countries need not restrict themselves to domestic markets. Companies in the developing world can seek buyers in the large and deep markets of the West. These companies can enjoy the protections of TRIPS as they endeavor to sell their products abroad. But this is too sanguine a view. First, these

115. *Id.*
116. *Id.*
117. *See supra* notes 76-81 and accompanying text.

companies may find it difficult to compete with the big pharmaceutical companies of the West on their home turf, at least outside the domain of generic drugs. The big pharmaceutical companies hold the advantage of brand name recognition. Second, selling branded products in Western nations requires large outlays for advertising and for patenting, both of which are made more difficult for the company from a developing country by the capital constraints described above. Despite these odds, companies in developing countries do obtain patents both at home and abroad.[118] But cases of this sort are relatively rare, as the wide disparity between patenting by developing states versus developed states demonstrates.[119]

Indeed, the argument of the Western pharmaceutical industry in favor of strong international patent rights often implicitly relies upon this disparity in the patent-seeking capacity of companies in the developed and developing world. Only big pharmaceutical companies, they point out, have the capital and know-how to transform traditional knowledge and genetic resources into proven cures.[120] And such companies can operate only if they stand to recoup their investment through strong monopoly rights in inventions.[121]

The result is an international intellectual property regime that is sharply tilted in favor of the developed world. The intellectual products held in the developing world rest in a global public domain, while the intellectual products of the developed world are held closely by corporations. Though Indian enterprises were certainly aware of the commercial value of the neem tree, they were unable to invest the resources to patent its derivatives throughout the world. Thus, the likely beneficiaries of the public domain resources of the traditional knowledge about the properties of the neem tree and the neem tree itself are multinational companies that are capable of converting these public domain resources into valuable patentable products. As James Boyle writes, "Curare, batik, myths, and the dance 'lambada' flow out of developing countries . . . while Prozac, Levis, Grisham, and the movie *Lambada!* flow in . . . ."[122] The former are unprotected by intellectual property rights, while the latter are protected.[123] In the end, the international intellectual property regime leads to a transfer of wealth from the poorer countries of the world to the richer countries. In

118. *See* Gardiner Harris & Joanna Slater, *Bitter Pills: Drug Makers See 'Branded Generics' Eating Into Profits*, WALL ST. J., Apr. 17, 2003, at A1.

119. *See supra* notes 84-87 and accompanying text.

120. *See* Nadia Natasha Seeratan, Comment, *The Negative Impact of Intellectual Property Patent Rights on Developing Countries: An Examination of the Indian Pharmaceutical Industry*, 3 SCHOLAR 339, 378-79 (2001) (presenting the Western pharmaceutical industry's viewpoint that without strong patent protection developing countries would unfairly profit from the research done by developed countries).

121. *Id.*

122. BOYLE, *supra* note 22, at 125.

123. *Id.*

1999, developing countries paid some $7.5 billion more in royalties and license fees than the royalties and license fees they received, even though this year was well before the deadlines for full implementation of TRIPS obligations in the developing states.[124] The U.S., by contrast, saw an $8 billion increase in its surplus of royalties and fees related mainly to intellectual property transactions between 1991 and 2001.[125] It is a strange world, indeed, where technology and resources flow for free from poorer to richer states, rather than from richer to poorer.

While it is certainly not their intent, scholars' romantic portrayals of the public domain perpetuate this inequality. The romance of the public domain—the notion that when a resource is open to all by the force of law, all will be equally able to exploit it—obscures the harsh realities of a world fraught with inequality. But the trope of the romantic public domain goes even further. It offers a *justification* for leaving the developing world's genetic resources and knowledge in the public domain: universal benefit from a rich public domain.

III
UNCOMMON PROPERTY

Even while scholars fail to recognize the romance of the public domain, countries all over the world are taking steps to address it. From Brazil to Zimbabwe, from Costa Rica to Thailand, states have adopted *sui generis* legislation and entered into agreements to reclaim traditional knowledge and genetic resources from the global public domain. In this Part, we survey these and other efforts to reorder the exploitation of the commons. Where most intellectual property scholarship is equality indifferent with respect to the commons, these efforts to restructure the commons are equality minded.

By locating in these efforts a response to the romance of the commons, we offer a theoretical grounding for them that has been heretofore absent from intellectual property scholarship. These efforts are often difficult to justify under traditional intellectual property jurisprudence, which, at least in theory, offers copyright and patent as mechanisms to spur production of intellectual works. Knowledge that has existed for generations or information held in flora and fauna does not respond to economic incentives, although such incentives should lead to greater production of such knowledge in the future and to greater efforts to preserve previously developed information. But rather than rely on incentives to justify ownership

124. IPR COMMISSION REPORT, *supra* note 85, at 21.
125. *Id.*

claims with respect to intellectual products, we might focus on the distributional consequences of such claims.

Indeed, efforts to redress the imbalanced exploitation of the commons, often while preserving a public domain, are widespread, if relatively unnoticed. We find them in intellectual realms as distinct as the computer operating system Linux, international traditional knowledge databases, the Convention on Biological Diversity, and *sui generis* intellectual property statutes. By collecting these real-world projects we hope to show their underlying commonality as creative efforts to foster shared knowledge while redressing distributional side effects. These approaches promise more to developing nations than the obvious alternative, abandoning the commons through privatization. Privatization may indeed avert the tragedy of the commons, but it carries its own distributional favoritism for certain constituencies.[126] Moreover, preserving a resource in the commons might, in some instances, prove more efficient than holding those resources in private.

We identify four equality-minded strategies to reorder the commons: inalienability rules, contract rules, property rules, and affirmative support programs. With their famous taxonomy of legal rules (represented by the first three of these strategies), Calabresi and Melamed sought to deconstruct strategies for protecting entitlements.[127] With the addition of a fourth strategy, we find their taxonomy quite helpful in analyzing approaches to protect a broad public entitlement to an egalitarian commons. We caution that our description of such strategies should not be mistaken for uncritical espousal of such efforts. Each of these projects has its own possible weaknesses, from potential difficulties in implementation to possible impediments to innovation.

That there are many efforts to create a more equality-minded commons should not come as a surprise. Even while Western intellectual property scholarship ignores the distributive consequences of the public domain, the rest of the world has long recognized this feature of the commons. Indeed, it has been an important element in the development of international law (outside intellectual property) over the past half century. International law expects that, without regulation, resources in the global commons will be exploited unequally.[128] Accordingly, with respect to the

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126. *See* Chander, *supra* note 15, at 727-36; *see also* Amy L. Chua, *The Privatization-Nationalization Cycle: The Link Between Markets and Ethnicity in Developing Countries*, 95 COLUM. L. REV. 223, 298 (1995) (seeking to craft privatization methods that "disperse the benefits of privatizations to an extent far greater than has been done in the past").

127. Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1090 (1972) (defining "entitlement" as a legal decision that selects a prevailing party when two or more persons have conflicting interests: for example, "the entitlement to make noise versus the entitlement to have silence").

128. *See* Chander, *supra* note 15, at 749-50.

traditional set of global commons resources—the deep seas, Antarctica, and outer space—international law has developed regimes to constrain the one-sided exploitation that can be expected of a commons.[129] Such regimes grew out of an explicit concern among developing nations in the postcolonial era that richer countries would dominate the resources that lay as yet unclaimed by any sovereign.[130] They recognized that the technological and economic advantage of a few Western powers would allow those countries to exploit the far reaches of the earth and space. By the time the developing world gained the wherewithal to reach the resources of the ocean beds, outer space, and Antarctica, these resources would already be claimed.[131] Accordingly, developing nations sought to establish international legal regimes that prevented such unilateral domination of these global common spaces.[132] Instead of a rule of *res nullius*, where the resource lies unclaimed for the taking, they argued for a rule of *res communis*, which requires any use to benefit all humanity.[133] If *res nullius*, the resource belongs to no one; if *res communis*, to everyone. Global commons regimes grew from the recognition that a *res nullius*, first possession approach would advantage certain countries at the expense of others.[134]

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129. For a summary of each of these international law regimes, see Chander, *supra* note 15, at 751-56.

130. *Cf.* CHRISTOPHER C. JOYNER & ETHEL R. THEIS, EAGLE OVER THE ICE: THE U.S. IN THE ANTARCTIC 162 (1997) (noting that "new states that emerged from decolonization" sought "to correct perceived inequities in the world economic system by establishing international control over resources beyond the limits of national jurisdiction").

131. *See* J.M. Spectar, *Saving the Ice Princess: NGOs, Antarctica & International Law in the New Millennium*, 23 SUFFOLK TRANSNAT'L L. REV. 57, 63 (1999) (noting that, to the group of developing nations known as the G-77, "free and open access had the tendency to suggest 'a commons where resources are up for grabs by the most technologically advanced'") (citing PHILLIP QUIGG, A POLE APART: THE EMERGING ISSUES OF ANTARCTICA 164, 178 (1983)).

132. *Cf.* JOYNER & THEIS, *supra* note 130, at 165 (noting that "[m]ost developing countries consider the [common heritage of mankind] concept as a legally binding prohibition against unilateral exploitation of resources in areas designated a common heritage").

133. *Res communis* can be, and often is, interpreted as effectively equivalent to *res nullius* by saying that the fact that something is "common" only means that anyone can acquire it (which amounts to *res nullius*). We resist this interpretation in favor of one that makes a sharp distinction between *res nullius* and *res communis*.

134. Owen J. Lynch and Gregory Maggio explain why:

> Most developing countries do not have the technical or financial matériel to exploit natural resources in these global commons spaces. For at least the past two decades, the South has argued on moral and legal grounds in the United Nations that these resources should not be claimed and carved up for the exclusive use of a small club of wealthy powerful states . . . .

Human Rights, Environment and Economic Development: Existing and Emerging Standards in International Law and Global Society, Ombudsman Centre for Environment and Development, *at* http://www.omced.org/wri/wri_legal1.htm (last visited Apr. 8, 2004). To be sure, international law may not require that resources in the global commons be treated as *res communis*. Each of the international law regimes for governing claims in the oceans, outer space, and Antarctica developed through long, difficult, and ongoing negotiations among the world's states, not through the application of a general international law principle founded in egalitarianism. Moreover, the regimes are quite fragile, generally untested by actual practice because the exploitation of the deep seas, outer space, and Antarctica remains economically unattractive.

While the international law regime in these commons of tangible global resources seeks to thwart one-sided expropriation, the global commons in information remains unguarded from such imbalances. Thus, the international legal regime for intellectual property, which effectively treats traditional knowledge and biogenetic resources as belonging to the public domain—a global commons upon which anyone can draw—stands in sharp relief against the more egalitarian approach of other international global commons regimes.

A. Inalienability: Traditional Knowledge Databases and Linux

One method of avoiding the unequal exploitation of a commons is to defeat attempts to propertize it. Users are thereby prevented from gaining exclusive proprietary rights, often the key to garnering large profits. The inalienability rules described here seek to prevent the commons from becoming the building blocks of proprietary claims.

1. Traditional Knowledge Databases

Because a criterion of patentability is novelty, the demonstration of "prior art"—for example, a published description of the medicinal properties of an herb—to a patent office should lead to denial of a requested patent. But in contexts where a patent request in a Western country deals with information that was already known in foreign or indigenous traditional communities, patent offices face a practical challenge in assessing novelty. Accordingly, countries are creating traditional knowledge databases (TKDs) to collect their innovation heritage. By offering up TKDs to patent offices worldwide, they hope to improve the prior art information available to patent officers testing claims, thereby preventing propertization by advanced companies of traditional knowledge.[135]

The two most populous countries in the world, China and India, are at the forefront of this enterprise. China offers a Traditional Chinese Medicine Patents Database, recording traditional acupuncture, herbal medicine, animal-derived drugs, and mineral drugs in a format searchable by patent examiners.[136] The Indian government has created a Traditional Knowledge Digital Library (TKDL)[137] to record systematically, in digital form, knowledge of Ayurveda, a traditional Indian system of medicine.[138] The TKDL is perhaps the most self-conscious of the efforts to make

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135. *See* WIPO Intergovernmental Committee, *Inventory of Existing Online Databases Containing Traditional Knowledge Documentation Data*, Third Session, Geneva, June 13-21, 2002, WIPO Doc. No. WIPO/GRTKF/IC/3/6 (May 10, 2002).

136. *Traditional Chinese Medical Databases Online System*, http://wall.cintcm.ac.cn/webdkrh1/e_index.htm (last visited Sept. 2, 2004).

137. Suvira Srivastava, *Biopirates Beware!*, TERRAGREEN, Mar. 15, 2002, *at* http://www.teri.res.in/teriin/terragreen/issue8/news.htm.

138. IPR COMMISSION REPORT, *supra* note 85, at 81.

traditional knowledge inalienable from the public domain, seeking explicitly to "build[] the bridge between the knowledge contained in an old Sanskrit Shloka and the computer screen of a patent examiner in Washington."[139]

For its part, the World Bank has sought to collect African and other regional indigenous knowledge in a database.[140] While the World Bank's stated objective is to enable international planners "to design activities to better serve the [local] community needs,"[141] it serves as a modest beginning to a storehouse of global prior art. The database currently includes a few hundred entries, from postpartum maternal and child health care rites among the Igbo of Nigeria[142] to *Aymara Kuru*, an ancient rural Peruvian technique of weaving belts.[143]

2. Linux

Linux, the rapidly emerging rival to Microsoft's dominant operating system, Windows,[144] traces a cunning route to inalienability. Linux puts private property and freedom of contract in the service of the public domain. To achieve this, Linux relies on a form agreement called the GNU General Public License (the "GPL").[145] Software licensed under the GPL is freely available to others to use,[146] copy,[147] distribute,[148] and modify.[149] But the genius of the GPL lies in the fact that subsequent derivations of the initial program must also be distributed under the GPL.[150] The GPL *runs*

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139. R.A. Mashelkar, Intellectual Property Rights and the Third World 12, *at* http://sustsci.harvard.edu/ists/TWAS_0202/mashelkar_undated.pdf (last visited Aug. 20, 2004).

140. *See, e.g.*, The World Bank Group, Database of Indigenous Knowledge and Practices, *at* http://www.worldbank.org/afr/ik/datab.htm (last visited Apr. 8, 2004).

141. The World Bank Group, Objectives of the Indigenous Knowledge Program, *at* http://www.worldbank.org/afr/ik/object.htm (last visited Apr. 8, 2004).

142. The World Bank Group, *supra* note 140 (database search results on file with the California Law Review).

143. *Id.* (database search results on file with the California Law Review).

144. For a sample of Linux deployments—from city workers in Key Largo, Florida and Beijing to designers at Pixar studios—see Byron Acohido, *Linux Took on Microsoft and Won Big in Munich; Victory Could be a Huge Step by Up-and-Comer*, USA TODAY, July 14, 2003, at A1.

145. The license represents the initiative of Richard Stallman of the Free Software Foundation. *See* Richard Stallman, *The GNU Manifesto*, Free Software Foundation (1993), *at* http://www.fsf.org/gnu/manifesto.html. The current version of the GNU General Public License (1991) can be found at http://www.fsf.org/licenses/gpl.txt (last visited Sept. 2, 2004) [hereinafter GPL]. Other similar permissive licenses exist. *See, e.g.*, Mozilla Public License 1.1, *at* http://www.opensource.org/licenses/mozilla1.1.php (last visited Sept. 2, 2004).

146. *See* GPL, *supra* note 145, at § 0 ("The act of running the Program is not restricted . . . .").

147. *Id.* § 1 ("You may copy . . . .").

148. *Id.* § 1 ("You may . . . distribute verbatim copies . . . .").

149. *Id.* § 2 ("You may modify your copy . . . of the Program . . . .").

150. *Id.* § 2(b) ("You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.").

with the initial software program in viral fashion.[151] The result is that the n^{th} derivative of a program, like the original, must be made similarly available to others for use and development. Through the "Internet barn-raising"[152] efforts of programmers worldwide working under the terms of the GPL, Linux has developed into an operating system capable of running super-computers.[153]

Crucial to this success was the fact that Linux's authors rejected the simple alternative of surrendering all property rights in the software. While this alternative would clearly enable others to use, copy, distribute, and modify the software for free, the creators of the GPL recognized the danger it posed to their long-term aspirations to keep software from being tightly controlled by a small group. To put programs into the public domain entirely unencumbered by property claims would make them easily susceptible to propertization by others. Those who improved the program would claim a copyright in the derivative work. The Free Software Foundation, an organization which promotes the GPL, explains:

> The simplest way to make a program free is to put it in the public domain . . . uncopyrighted. This allows people to share the program and their improvements, if they are so minded. But it also allows uncooperative people to convert the program into proprietary software . . . . They can make changes, many or few, and distribute the result as a proprietary product. . . .
>
> . . . So instead of putting GNU software in the public domain, we 'copyleft' it. Copyleft says that anyone who redistributes the software, with or without changes, must pass along the freedom to further copy and change it.[154]

Those who might seek to claim exclusive property rights in the derivative work would run afoul of the terms of the license.[155] Earlier generations of software programmers along the license chain with respect to any particular software project would each have a copyright infringement claim against any subsequent propertizing interlopers.

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151. Margaret Jane Radin, *Humans, Computers, and Binding Commitment*, 75 IND. L.J. 1125, 1132-33 (2000).

152. *See* MIKE GODWIN, CYBER RIGHTS: DEFENDING FREE SPEECH IN THE DIGITAL AGE (1998); *see also* U.S. v. Microsoft Corp., 84 F. Supp. 2d 9, 23 (D.D.C. 1999) ("[Linux] was created, and is continuously updated, by a global network of software developers who contribute their labor for free.").

153. Chris Gulker, *Is a Linux Supercomputer in your Future?*, NEWSFORGE, Aug. 26, 2003, *at* http://newsforge.com/article.pl?sid=03/08/18/193205; Robert McMillan, *Lab Soups Up Linux Supercomputer*, COMPUTERWORLD, Aug. 27, 2003, *at* http://www.computerworld.com/softwaretopics/os/linux/story/0,10801,84429,00.html (describing $24.5 million system to be used to study basic chemistry and biology).

154. Free Software Foundation, GNU Project, Licenses, *at* http://www.fsf.org/licenses/licenses.html (last updated Feb. 26, 2004) (emphasis added).

155. *See* David McGowan, *Legal Implications of Open-Source Software*, 2001 U. ILL. L. REV. 241, 244.

A glance at Linux's rapid adoption worldwide[156] demonstrates that Linux has an egalitarian streak. Because the operating system must be distributed for a nominal price,[157] computers running Linux are cheaper than those based on proprietary operating systems such as Windows. At the time of this writing, Walmart was selling a Linux-based computer for $199,[158] while its cheapest Windows-based machine was $308.[159] Faced with the threat of cheap, Linux-based computers sold under a Thai government program to bring computing to the masses, Microsoft slashed the price it charges for Windows.[160]

Why does Linux seem to have this egalitarian effect of making the personal computer significantly more available to the common person? The answer lies largely in the GPL. Because the GPL regulates derivations of Linux, the inevitable improvements on Linux must also be shared according to the free access principle of the original. Thus, all subsequent innovators must contribute their own work to the public domain. Even when technology giant IBM invests one billion dollars into improving Linux,[161] the resulting work must still be dedicated to the public domain.

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156. *See, e.g.*, *Asian Powers Seal Operating System Plan*, ZDNET UK, Sept. 8, 2003, *at* http://news.zdnet.co.uk/software/linuxunix/0,39020390,39116181,00.htm (reporting on preliminary plan of China, Korea, and Japan to develop open-source operating system as an alternative to proprietary Windows and Unix); Winston Chai, *Governments are Latching onto Linux*, ZDNET, May 12, 2003, *at* http://zdnet.com.com/2100-1104-1000992.html; Scott Morrison, *HP Plans Switch to Linux*, FIN. TIMES (London), Mar. 25, 2004, *available at* 2004 WL 72881546 (reporting that HP will install Linux software in PCs, which enables the company to reduce the price of its products destined for Asia); S. Srinivasan, *Indian Companies Launch Cheap Handheld Computer for Rural Poor*, SAN JOSE MERCURY NEWS, Mar. 28, 2004, *available at* 2004 WL 74784761 (describing cheap handheld computer designed by Indian scientists "for use by the poor" available for $220, which uses the Linux operating system "to keep costs down").

157. *See* GPL, *supra* note 145, § 1 ("You may charge a fee for the physical act of transferring a copy . . . .").

158. *See* Walmart.com, Linux OS PCs, *at* http://www.walmart.com/catalog/catalog.gsp?cat=106562&path=0%3A3944%3A3951%3A41937%3A106562 (last visited Feb. 2. 2004) (offering, for $199.98, a desktop computer with AMD Duron 1.4 GHz processor, 128 MB memory, 20 GB hard drive, CD-ROM drive, Ethernet connection, Linux-based operating system, but not including monitor, modem, and floppy disk).

159. *See* Walmart.com, Mocrotel SYSMAR182 PC With 1.2 GHz Duron, *at* http://www.walmart.com/catalog/product.gsp?product_id=2292473&cat=120870&type=19&dept=3944&path=0%3A3944%3A3951%3A41937%3A120870 (last visited Feb. 2, 2004) (offering, for $308, a desktop computer with AMD Duron 1.2 GHz processor, 128 MB memory, 40 GB hard drive, CD-ROM drive, Ethernet connection, Windows XP operating system, but not including monitor, modem, and floppy disk).

160. Rebecca Buckman, *Face-Off over People's PCs: Microsoft Discounts Software in Thailand to Battle Linux in Cheap Computer Sales*, WALL ST. J., Aug. 14, 2003, at B1 (describing Thai government program to sell personal computers based on Linux, resulting in Microsoft participation at sharply discounted price for Windows-based personal computers); John Lui, *Thailand's Cheap PCs 'Force Microsoft's Hand,'* ZDNET UK, Aug. 22, 2003, *at* http://news.zdnet.co.uk/software/windows/0,39020396,39115884,00.htm.

161. *See* IBM, 2001 ANNUAL REPORT 21 (noting that "1000 IBM developers—more than at any other company—are working on Linux"), ftp://ftp.software.ibm.com/annualreport/2001/ibm2001.pdf (last visited Sept. 2, 2004). IBM has reported to investors that it has already recouped its investment in

The usual dynamic—transfers from the public domain into private hands—is aborted by the terms upon which the software is initially introduced into the public domain.

3. Creative Commons

The Creative Commons project housed at Stanford Law School employs a similar strategy of structuring the public domain through licenses. The Creative Commons offers artists, authors, and musicians simple, predefined terms on which they can dedicate their work to the public domain. Rather than implicitly hold on to property rights that the artists may not desire, they can cede their rights in favor of public access and use—but with some reservations. In the typical American implementation, authors can choose any, all, or none of the following license terms: attribution to the original author, use for non-commercial purposes only, no derivative works, and a requirement to share-alike (the last term requiring authors of derivative works to offer those works under an identical license).[162]

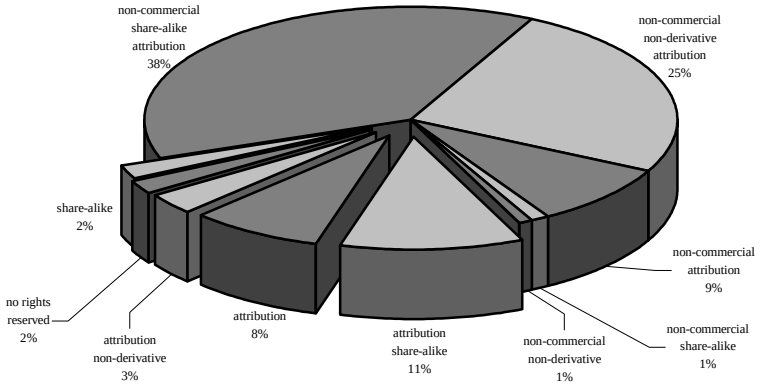
A review of the choices authors are actually making with respect to the licenses is illuminating. Figure 2 supplies a breakdown of license terms selected, based on data from March 2004.[163] As might be expected from our common vanity, but in contrast to American law's distaste for moral rights, almost all authors require attribution. Roughly three-fourths of dedications require that subsequent users only make non-commercial use of the work, while half demand that subsequent users also dedicate derivative works to the public domain under a share-alike license, thereby seeking to expand the public domain in viral fashion. Only two percent of the dedications impose no restrictions whatsoever. Only eight percent of the dedications require attribution but no other restrictions.

Linux through sales of services and hardware associated with Linux. IBM's contributions to Linux have made it the subject of a lawsuit. *See* Anupam Chander, *Penguin on Thin Ice? Why IBM Should Win in the Fight to Save Linux*, FINDLAW'S WRIT, June 26, 2003, *at* http://writ.news.findlaw.com/commentary/20030626_chander.html.

162. *See* Creative Commons, *Choose a License*, *at* http://creativecommons.org/license (last visited August 7, 2004).

163. The Figure omits two license types because the number of people selecting such licenses was nearly zero; the omitted licenses are (1) the license carrying the restriction "no-commercial use," but no other restrictions; and (2) the license carrying the restriction "no derivative works," but no other restrictions. Authors selecting "no commercial use" or "no derivative works" almost always selected one or more other license restrictions as well.

Figure 2
Rights Reserved upon Dedication to Creative Commons



Source: Data provided by Creative Commons, March 2004 (on file with authors)

By prohibiting commercial use or requiring subsequent users to share-alike, the author assures that her work cannot be commercially exploited by others, and, in turn, that creative works remain broadly accessible and usable. The predominance of the non-commercial and share-alike terms helps to establish a creative community in which works are shared, modified, and rededicated to the public to be re-worked. These terms disrupt the familiar exploitation of the public domain by propertied interests. We characterize the Creative Commons as an inalienability approach because of the predominant requirement that users of the public domain material not be allowed to gain commercially from the use (through the no-commercial-use license term, or the share-alike provision). What is striking from observing the data on the early years of the Creative Commons is that, when permitted to choose for themselves, very few prefer an unstructured commons—the realm of unrestricted public domain—to a structured one. These Creative Commons licenses pragmatically redress the inegalitarian exploitation of the public domain without stifling either property or the public domain in the process. The licenses facilitate innovation, speech, and the distribution of rights to make, access, and remake culture.

4. Assessing Inalienability

The traditional knowledge database approach carries a significant risk: perhaps a DVD collating traditional knowledge will present that knowledge to Western companies in the form of a nice, bow-tied gift. Putting the information on the Internet in English will even make the anthropological investigatory trip or translation unnecessary. Exactly because of this concern, India, for example, plans to make the TKDL

available (1) only to patent offices worldwide, and (2) only under a non-disclosure agreement.[164]

But there is a more significant concern, one that affects not only the Traditional Knowledge Databases made available online, but also the secret Indian TKDL. TKDs can only prevent efforts to privatize that which is already known, not "inventive leap[s] over the prior art."[165] Thus, as long as a patent claimant substantiates such an inventive leap, she can build upon the knowledge in the public domain and seek exclusive property rights in her improvement. As Mark Lemley describes, "[i]mprovers are free to use material that is in the public domain because the copyright or patent has expired."[166] Linux's approach to the public domain, however, eliminates this possibility—at least during the term of the intellectual property rights held by earlier creators of Linux.

The TKD approach has advantages and disadvantages for developing countries. It establishes the ingenuity of traditional communities and forecloses the patenting of at least some of the knowledge they hold. In this way, it reduces the likelihood that the developing countries will face the unnerving prospect of paying to import patented versions of their own traditional knowledge. It also reduces the offense felt by some at the exploitation of traditional knowledge by outside commercial forces. However, improvements upon such knowledge may still be patentable. More importantly, by preventing monopoly rights in certain information, the TKD might reduce the economic value of that information, leaving diminished profits to share with local communities.

B. Property Rules: Sui Generis *Traditional Knowledge and Genetic Resource Statutes, the Convention on Biological Diversity*

Another response to the asymmetric exploitation of the public domain is to declare traditional knowledge and genetic information to be the property of defined communities. Indeed, nations from Brazil to the Philippines have passed statutes to protect indigenous knowledge and genetic resources, typically vesting rights to such knowledge either in the state or in local communities.[167] These approaches generally create limited commons

164. WIPO Intergovernmental Committee, *Report*, Fourth Session, Geneva, at para. 140, WIPO Doc. No. WIPO/GRTKF/IC/4/15 (Dec. 17, 2002).

165. Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 TEX. L. REV. 989, 1007 (1997).

166. *Id.* at 991.

167. *See* WIPO Intergovernmental Committee, *Information on National Experiences with the Intellectual Property Protection of Traditional Knowledge*, Fifth Session, Geneva, Annex II, WIPO Doc. No. WIPO/GRTKF/IC/5/INF/2 (Apr. 4, 2003).

property regimes, with property available for free to those inside, but at a price to those outside.[168]

1. Sui Generis *National Statutes*

The Philippines helped pioneer such protective legislation through a 1995 order to regulate the prospecting of genetic resources.[169] The Order recites the Philippine Constitution's investiture of the country's wildlife, flora, and fauna in the state. It permits prospecting with respect to these public resources only with the prior informed consent of the relevant local communities[170] and only after the government enters into a bioprospecting agreement with the person seeking to collect biological samples.[171] The bioprospecting agreement must provide for the payment of royalties in the event that "commercial use is derived from the biological and genetic resources" collected.[172] The Order specifically exempts traditional uses of biological resources by indigenous communities,[173] thus creating a limited commons property regime in these resources.

Costa Rica's historic 1991 agreement, between a government-created nonprofit organization and the multinational pharmaceutical company Merck, allows collection of biological samples in Costa Rica and offers another important model of innovative protections. In return for the right to collect the samples, Merck agreed to pay the nonprofit organization, the Instituto Nacional de Biodiversidad (INBio),[174] one million dollars over two years, as well as royalties of an undisclosed percentage of the revenues from any commercial product developed from an INBio sample.[175] Costa Rica's 1998 Biodiversity Law buttresses the INBio model, declaring state ownership over biodiversity and requiring state permission, prior informed consent of the local community, and a royalty-sharing agreement before access can be granted to the state's biodiversity.[176]

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168. *See* Rose, *supra* note 30, at 155 (defining limited commons property as "a regime that holds some resource as a commons among a group of 'insiders,' but as an exclusive right against 'outsiders'—commons on the inside, property on the outside").

169. Phil. Exec. Order No. 247 (May 18, 1995) (delineating guidelines and establishing a regulatory framework for the prospecting of biological and genetic resources, including their by-products and derivatives, for scientific, commercial, and other purposes), http://www.elaw.org/resources/printable.asp?id=257.

170. *Id.* § 2.

171. *Id.* § 3.

172. *Id.* § 5(e).

173. *Id.* § 3.

174. *See* Instituto Nacional de Biodiversidad, Frequently Asked Questions, *at* http://www.inbio.eas.ualberta.ca/en/inbio/Faqs.html (last visited Feb. 2, 2004).

175. John Eberlee, *Assessing the Benefits of Bioprospecting in Latin America*, INT'L DEV. RES. CENTRE REP., Jan. 21, 2000, *at* http://network.idrc.ca/ev.php?ID=5571&ID2=DO_TOPIC.

176. *See* Costa Rica Biodiversity Law, Law No. 7788 (1998), http://www.lclark.edu/org/ielp/costaricaeng.html (unofficial English translation) (last visited Sept. 2, 2004).

Similarly, in 1998 the African Union (then the Organization of African Unity) proposed a model law for adoption by its member states that would regulate access to genetic resources and traditional knowledge.[177] The model law would require prior informed consent of the state and the local communities concerned (with a requirement to ensure "that women are also involved in decision making") for access to biological resources in any part of the country.[178] It would also require benefit sharing where any such resource yielded commercial products.[179]

As surveys conducted by the World Intellectual Property Organization demonstrate, *sui generis* protections for both traditional knowledge and genetic resources are increasingly common in national law. Brazil, Panama, Peru, and Portugal, for example, have each passed traditional knowledge protection statutes.[180] At least twenty countries have adopted such protections, and others are in the process of considering such legislation. The ten countries of the Association of South East Asian Nations (ASEAN) are developing a Framework Agreement on Access to Biological and Genetic Resources.[181]

Bioprospecting agreements and claims for sovereignty over genetic resources are not unique to developing countries. The Australian state of Queensland is currently nearing completion of its own "Biodiscovery Bill 2004," which would condition access to the Queensland's biological resources on public lands on agreements reached with state authorities, including agreements on benefit sharing.[182] Even the United States has entered into bioprospecting arrangements concerning access to Yellowstone National Park.[183]

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177. *See* Organization of African Unity, African Model Legislation for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources (2000), *at* http://www.opbw.org/nat_imp/model_laws/oau-model-law.pdf (last visited Sept. 2, 2004). The OAU amended this model to its current form in Algiers in 2000. *See* WIPO Intergovernmental Committee, *Proposal Presented by the African Group to the First Meeting of the Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore*, 1st Sess., Geneva, WIPO Doc. No. WIPO/GRTKF/IC/1/10 (May 1, 2001).

178. Organization of African Unity, *supra* note 177, at art. 5(1). Local communities would continue to enjoy the right to use the biological resources. *Id.* at art. 21.

179. *Id*. at art. 12.

180. *See* WIPO Intergovernmental Committee, *Information on National Experiences with the Intellectual Property Protection of Traditional Knowledge*, Fifth Session, Geneva, WIPO Doc. No. WIPO/GRTKF/IC/5/INF/2 (Apr. 4, 2003).

181. *See* WIPO Intergovernmental Committee, *Report*, First Session, Geneva, at para. 22, WIPO Doc. No. WIPO/GRTKF/IC/1/13 (May 23, 2001).

182. *See* http://www.legislation.qld.gov.au/Bills/51PDF/2004/BiodiscoveryB04.pdf (last visited Sept. 2, 2004).

183. *See, e.g.*, Mike Wood, *Are National Park Resources for Sale?:* Edmonds Institute v. Babbitt, 21 PUB. LAND & RESOURCES L. REV. 201, 202 (2000) (discussing a court decision upholding an agreement between National Park Service and biotechnology company granting the company the right to bioprospect microbial organisms in Yellowstone in exchange for a share of profits (citing *Edmonds Institute v. Babbitt*, 93 F. Supp. 2d 63 (D.D.C. 2000))).

2. Convention on Biological Diversity

The Convention on Biological Diversity (CBD), an international treaty, offers a foundation for this property approach.[184] It declares the "sovereign rights of States over their natural resources"[185] and mandates "sharing in a fair and equitable way the results of research and development and the benefits arising from the commercial and other utilization of genetic resources with the Contracting Party providing such resources."[186] While 187 states have subscribed to the CBD, the United States has never ratified the Convention.[187] Whether or not the CBD can be characterized as customary international law, it offers an intellectual grounding for the claim that each state is obliged to protect the property rights of foreign states and communities to their genetic resources. A United Nations General Assembly resolution from 1962 offered an earlier international legal underpinning for this claim. The famous "Resolution on Permanent Sovereignty over Natural Resources 1803" declares in Article 1, "The right of peoples and nations to permanent sovereignty over their natural wealth and resources." Like the CBD, this Resolution employs the language of "sovereignty," implying that control over the resource is to be vested in the state.

3. Assessing Property Rules

These examples each use property rules to protect state or local entitlements to genetic resources and traditional knowledge. Because these rules typically require prior informed consent before access, they permit the entitlement holder to deny others access to the protected resource, except on terms acceptable to that holder. Thus, the state or local community holding the entitlement can press for more favorable terms before permitting access—though it will, of course, face competition from other sources of similar entitlements also selling access. In requiring consent before access, property rules also permit the entitlement holder to demand the right to share in the benefits from the commercialization of any derivatives of the genetic resources or traditional knowledge.

But these laws share a basic flaw. They can be futile in the face of an international order in which the commercialization of traditional knowledge and genetic resources generally occurs far from the source of such knowledge. For example, while Brazil may be able to prosecute violations

184. *See* Convention on Biological Diversity, *supra* note 25.

185. *Id.* at art. 15, § 1 ("Recognizing the sovereign rights of States over their natural resources, the authority to determine access to genetic resources rests with the national governments and is subject to national legislation.").

186. *Id.* at art. 15, § 7.

187. Convention on Biological Diversity, Parties to the Convention on Biological Diversity, *at* http://www.biodiv.org/world/parties.asp (last updated Mar. 30, 2004).

of its laws against Brazilians and foreigners in Brazil, the Brazilian government will find it difficult to reach corporations elsewhere. This is, of course, the same dilemma that faced developed states as they sought to protect their own corporations' intellectual products in the 1980s and early 1990s. This led to the adoption of TRIPS as a vehicle for internationalizing standards of intellectual property protection. In order to effectuate their claims, developing states need to expand TRIPS to recognize their claims in traditional knowledge and genetic resources.[188]

Such a move, of course, requires recharacterizing traditional knowledge and genetic resources as property.[189] The term "biopiracy" already reflects efforts to do exactly this. In making such a move, developing states echo the U.S. music industry, which has similarly sought to characterize the uploading and downloading of music via the Internet as "piracy"[190] and has conducted an extensive public relations campaign to instill this perspective in consumers.

The move towards property raises the specter of the anticommons, where promiscuous allocation of narrow property rights leads to hold up of efficient production.[191] But it is not clear that the addition of rights holders will lead to an anticommons. Some will object that these shifts in the contents of the categories of "property" and "public domain" are in themselves troubling. Such was the concern of five Nobel laureate economists (including Kenneth Arrow and Ronald Coase), who filed an amicus brief with the

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188. *See, e.g.*, World Trade Organization Preparations for the 1999 Ministerial Conference [hereinafter WTO Preparations], Proposal on Protection of the Intellectual Property Rights Relating to the Traditional Knowledge of Local and Indigenous Communities, at paras. 9-10, WTO Doc. WT/GC/W/362 (Oct. 12, 1999) (advocating amending TRIPS consistent with the CBD); WTO Preparations, Proposals Regarding the TRIPS Agreement in Terms of Paragraph 9(a)(ii) of the Geneva Ministerial Declaration, at para. II.1, WTO Doc. WT/GC/W/282 (Aug. 6, 1999); WTO Preparations, The TRIPS Agreement, at para. 23, WTO Doc. WT/GC/W/302 (Aug. 6, 1999); WTO Preparations, Proposals Regarding the TRIPS Agreement in Terms of Paragraph 9(a)(i) of the Geneva Ministerial Declaration, at para. 4, WTO Doc. WT/GC/W/225 (July 2, 1999); *see generally* Laurence R. Helfer, *Regime Shifting: The TRIPS Agreement and New Dynamics of International Intellectual Property Lawmaking*, 29 YALE J. INT'L. L. 1 (2004) (arguing that developing nations' critiques of TRIPS have been empowered by the convergence of traditional international intellectual property regimes with nonstate, particularly NGO, lawmaking regimes in international law).

189. Such an approach has many antecedents. During the Uruguay Round negotiations leading up to TRIPS, one scholar proposed protecting genetic resources on a basis similar to copyright, by rewarding the person or community who preserved biodiversity as a "creator" (thereby seeking to obtain the well-known benefits of romantic authorship for that person or community). DANIEL GERVAIS, THE TRIPS AGREEMENT: DRAFTING HISTORY AND ANALYSIS 25 n.2 (1998); Arvind Subramanian, *Genetic Resources, Biodiversity and Environmental Protection—An Analysis, and Proposals Toward a Solution*, 26 J. WORLD TRADE 105 (1992).

190. Where piracy on the high seas involves the appropriation of scarce goods—goods that are rivalrous—"piracy" of digital music does not reduce the stock of that music available to its owner. This is often true as well of "biopiracy," which does not necessarily reduce the amount of biological material available to the local community, though it could if the samples are carelessly or excessively drawn.

191. James M. Buchanan & Yong J. Yoon, *Symmetric Tragedies: Commons and Anticommons*, 43 J. LAW & ECON. 1 (2000).

United States Supreme Court in *Eldred v. Ashcroft*[192] arguing that retroactive grants of intellectual property rights move intellectual property farther from its traditional economic raison d'être of providing incentives for innovation.[193] Indeed, intellectual property rights in traditional knowledge and genetic resources, as we have discussed, are also in tension with the traditional incentive model. But while unmooring intellectual property from its traditional anchor in economic incentives is uncomfortable, we must not run from new theoretical and normative developments in intellectual property law. To the extent that the new understandings of intellectual property and the public domain reflect concerns outside of utility and liberty—here, they herald greater equality and new social relations—we must consider these claims anew. Furthermore, new theoretical justifications for intellectual property notwithstanding, we must ask whether we find comfort in a system that makes exception from theoretical underpinnings only on behalf of powerful interests, and not for the powerless.

Of course, the asymmetric exploitation of the commons will likely persist even within a limited commons regime.[194] If a fund is established to collect royalties paid by outsiders, which insiders will benefit? Which farmers will have the greatest know how as to the process of claiming their share? More to the point—and following necessarily upon our opening image in this Article—should only farmers share in the benefits of commercialization of local knowledge? After all, landless members of the community might also hold the ethnobotanical knowledge and may have contributed to its development.[195]

Furthermore, a property approach, even one creating limited commons property, might well be contrary to some moral or religious beliefs. The recent move in environmental law to think of air in commodity terms (in units of pollution, tradable on the open market) is sharply contested.[196] Some will similarly find commodifying flora, fauna, and inherited cultural knowledge inappropriate, or even sacrilegious. The *sui generis* statutes at issue, however, permit the entitlement holders (typically both the local

192. 537 U.S. 186 (2003).

193. *See* Brief of Amici Curiae George A. Akerlof et al., Eldred v. Ashcroft, 537 U.S. 186 (2003) (No. 01-618) (arguing that the extension of the copyright term was more likely to harm social welfare than to enhance it).

194. For a poignant discussion of the effect of economic and cultural inequality among persons within a property commons, see Carol M. Rose, *Women and Property: Gaining and Losing Ground*, 78 VA. L. REV. 421 (1992).

195. *See* Michael Blakeney, *Intellectual Property, Traditional Knowledge and Genetic Resources*, Feb. 2003, at 17, WIPO Doc. No. WIPO/IP/CAI/1/03/12 (noting that "ethnobotanical knowledge . . . is not necessarily and only held by local landowning farmers, but can also be held by local communities that are landless").

196. James Salzman & J.B. Ruhl, *Currencies and the Commodification of Environmental Law*, 53 STAN. L. REV. 607 (2000).

community and the state authority) to, individually or together, deny access.

The shift in legal perspective required by this "uncommon property" perspective presents fearsome problems. How shall we define who are the proper inheritors of knowledge passed on over generations? Who shall authorize knowledge transfers on behalf of ill-defined communities?[197] How can we distinguish useful traditional knowledge from commonplace information? "[I]f a particular herb is used by the Maasai in Kenya, as well as by the Amazonian Indians, how does one identify the rightful inventor?"[198] But our existing intellectual property system—if viewed from a legal regime granting property rights only in tangibles—would present equally difficult challenges for implementation. How do we create a system of registration, distinguish inventions from copies, sort out author from fan, or create royalty payment schemes?[199] Legal systems regularly face and resolve fearsome problems.

C. Liability Rules

A liability rule permits outsiders to encroach upon a community's genetic resources or traditional knowledge, but only in exchange for an objectively-determined fee. By removing the requirement of local consent for the exploitation of local knowledge or genetic resources, a liability rule frees the market from inefficient bargaining failures.

Perhaps most beneficially, such a rule eliminates the possibility of an anticommons resulting from the accreditation of new property rights. A pharmaceutical company would have the right to assemble, for a price, the bundle of property rights it needed to invent a new drug. Somewhat more subtly, a liability rule might better protect the interests of local communities against foreign exploitation than a property rule. How? The explanation follows the form of a well-known economic argument. Given that both folklore and genetic resources often cross political boundaries, multiple communities will often house the same resource. Thus, a multinational corporation seeking access to a particular resource will be able to negotiate with a number of possible partners, playing each one against the others. Because the marginal cost of the preexisting resource is zero, neoclassical

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197. CORI HAYDEN, WHEN NATURE GOES PUBLIC: THE MAKING AND UNMAKING OF BIOPROSPECTING IN MEXICO 4, 85-122 (2003) (questioning legitimacy of Mexican public universities and research institutes acting as "brokers" for national and indigenous resources).

198. *Indigenous Knowledge and Intellectual Property Rights*, IK NOTES, Apr. 2000, at 2, http://www.worldbank.org/afr/ik/iknt19.pdf. This would necessitate a method to apportion the benefits among legitimate claimants.

199. *See* Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations*, 84 CALIF. L. REV. 1293, 1299-1300 (1996) (suggesting the superiority of privately-established Collective Rights Organizations over "a congressional scheme of one-size-fits-all transactions" in setting royalty rates).

economic theory would predict that the corporation would be able to purchase the resource for a price close to the marginal cost, that is, close to zero. Of course, the multiple communities housing a particular resource might form a cartel to strengthen their bargaining position, but this might be difficult to sustain because of the advantage of defection. Unlike a property rule, a liability approach would not rely on the bargain the local community struck to determine how much it would be compensated for the use of the resource. Rather the price for using the resource would be set "objectively" by a tribunal, perhaps an international one.

Turning to an international body to resolve such matters will itself trouble some readers. Yet it must be remembered that the international legal regime already empowers international tribunals to resolve cross-border disputes related to intellectual property. TRIPS relies on the World Trade Organization's dispute resolution mechanism to settle claims that any particular country is insufficiently attentive to the proprietary rights of the citizens of any other country. The existence of this supranational intellectual property authority serves as an important precedent for those who seek an internationally enforceable regime to stem the one-sided exploitation of developing countries' resources.

Despite its attractions, a liability approach seems unpopular as a strategy for organizing prized resources, probably because states prefer to assert control over their resources in order to prevent any disfavored persons from exploiting their resources, even for a "fair" price.[200] Liability rules prevent communities from being able to veto the use of their information resources.

A liability approach offers a middle position between adherents of a global information commons and champions of local property rights. Local communities would be paid for the resource (contrary to the existing global information commons approach), but they could not hold up or deny access to the resource (contrary to the property rule approach).

D. Affirmative Support Programs

Alternatively, if some people do not have the capital or skill to exploit the commons, perhaps we might find ways to supply them with the resources they are missing. Perhaps an equality-minded commons will only come to pass when we address developing nations' underlying unequal capacity to realize the opportunities available in the commons. This imbalance redressed, the commons may indeed open itself up equally to all.

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200. One interpretation of the Convention on Biological Diversity is that it sanctions a liability approach in its reference to "fair and equitable" sharing of the benefits of a resource. Of course, the antecedent declaration in Article 1 of the "sovereignty" of a nation-state over biological resources suggests that consent would be required for alienation, and thus offers a more property rule-type approach.

An interesting precedent for this approach comes from the heart of modern capitalism itself, the United States. While some might suggest that the free market is the greatest equalizer of opportunity—because everyone is free to offer a good or service in the market—the United States Congress has recognized that certain people will be at a disadvantage in competing in that market. Indeed, the Congress has sought explicitly to "promote the business development of small business concerns owned and controlled by socially and economically disadvantaged individuals so that such concerns can compete on an equal basis in the American economy."[201] Congress assists small business through promoting exports, facilitating technology transfer, assisting in access to capital, and disseminating information about public and private programs that help small business compete internationally.[202]

And once again, we see international efforts precisely along these lines.[203] The World Bank funds certain lending programs that build capacity in science and technology, especially in agriculture.[204] The European Union has provided technical assistance to transition economies through its Regional Industrial Property Programme.[205] Yet multilateral or bilateral efforts to improve the capacity of companies in the South to exploit the public domain remain insubstantial. By and large, the promises of technology transfer made in the postcolonial period have transformed over time into promises only to sell technology at market rates. Because of this, developing nations' *sui generis* genetic resource statutes often impose a technology transfer mandate. For example, the Philippines requires the involvement of local scientists in the bioprospecting, while Costa Rica requires training for local scientists.[206]

In large part, developing nations are hard put to take up the burden of improving the egalitarian potential of the public domain because they have very limited resources. The Indian Council of Scientific and Industrial

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201. 15 U.S.C. § 631(f)(2)(A) (1997) (stating one of the purposes of the Small Business Act, 15 U.S.C §§ 631-57e (1997)).

202. *Id.* § 631(b)(1).

203. It might be noted that the TRIPS Agreement obligates industrial countries to provide "technical and financial cooperation in favour of developing and least-developed country Members," but this obligation is limited to "mutually agreed terms and conditions." TRIPS, *supra* note 82, at art. 67.

204. *See* Michael F. Crawford, *Review of World Bank Lending for Science and Technology 1992-98* (TechNet Working Paper Series, 1999), *at* http://www.worldbank.org/html/extdr/gc/knowledge/technet.pdf (last visited Sept. 2, 2004).

205. *See* The Regional Industrial Property Programme, *at* http://www.european-patent-office.org/intcop/ripp/index.htm (last updated Feb. 1, 2002).

206. Sean D. Murphy, *Biotechnology and International Law*, 42 HARV. INT'L. L.J. 47, 115 (2001) (describing 1995 executive order issued by Filipino president as an attempt to impose technology transfer mandates); *see also* David S. Tilford, *Saving the Blueprints: The International Legal Regime for Plant Resources*, 30 CASE W. RES. J INT'L. L. 373, 437 (1998) (describing coalition of Central American states seeking to condition access to genetic resources on technology transfers and training).

Research, the state-sponsored research and development organization, has begun "aggressively filing patents in other foreign countries."[207] It marked 100 U.S. patents as a major achievement.[208] There are also private efforts to address the capital deficit of entrepreneurs in developing countries. The approach, pioneered by the Grameen Bank of Bangladesh, seeks to catalyze economic development through micro-loans to entrepreneurs too poor to qualify for traditional bank loans.[209]

This has been the focus of a Danish artists group called Superflex, which has traveled around the world working with local farmers whose crops have been appropriated as raw materials by multinationals who develop the crop into soft drinks and coffees for global consumption. Superflex uses the tools of commerce to empower impoverished communities. Familiar with the commercial strategies of multinational corporations, Superflex seeks to train local communities in those strategies, hoping to assist those communities in competing with corporations on a more equal footing. As part of its "counter-economic strategy" approach, Superflex has worked with a Brazilian farmers' cooperative in Maues, Brazil, which grows the guarana berry that has long been prized by the local population for its medicinal and energy-giving properties.[210] The Brazilian company AmBev and Pepsi Co. have successfully marketed global energy drinks derived from this plant, most notably the Antarctica drink. To local Maues farmers' detriment, the MNCs have formed a cartel that reportedly has driven down the price of the guarana berries from $25/kilo to $4/kilo.

The cooperative responded by creating their own competing products. In collaboration with Superflex, the cooperative consulted with lawyers about intellectual property rights, raised capital, searched for global distributors, and designed a label for its own soft drink called Guarana Power. (Guarana Power is part of the artists' Supercopy project, which appropriates global "brands" as raw materials.[211]) In short, the Superflex affirmative support effort recognizes that knowledge, as well as capital, is necessary to enable more equal exploitation of both property and the public domain.

CONCLUSION

Some will suggest that the asymmetric exploitation of the public domain is not a problem of the commons, but rather, just another unhappy consequence of poverty. To be sure, poverty affects the ability of

207. Council of Scientific & Industrial Research, Patestate News and Notes, *at* http://www.patestate.com (last visited Sept. 2, 2004) (on file with the California Law Review).

208. *Id.*

209. *See* Grameen Bank, Grameen—Banking for the Poor, *at* http://www.grameen-info.org (last modified Apr. 4, 2004).

210. *See* Superflex, Guarana Power *at* http://www.superflex.net/tools/supercopy/guarana.shtml (last visited Sept. 2, 2004).

211. *Id.*

individuals to exploit property, intellectual property, and every other legal entitlement. The unequal tilt in the public domain's exploitation follows naturally from the dynamics of production and commerce in a world characterized by deep inequality.

Still, to the extent that law affirmatively creates or preserves a public domain, it is appropriate to ask who this public domain will likely serve. The banner of the public domain is taken up in all of our names, but this proves ultimately romantic.