

Leveraging Scientific Commons to Foster Innovation, Access and Affordability

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Biotechnology and Intellectual Property:
Restructuring for the Public Benefit
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If the goal of this conference is how to harness public benefit from biotechnological innovation, I would like to talk about the importance of the commons as a complement to the marketplace. We can learn some important lessons from the way that commons and markets interact in domains as diverse as science, the Internet, music, the visual arts, and even fashion. The theme I wish to develop is that the commons is a source of innovation and value in its own right, and can be a potent force in spurring public benefits from biotechnological research.

What is the commons? A commons is a regime for creating and managing value through non-market means. It consists of the resources that we inherit from previous generations, and which we must pass along, intact, to our children. A commons may consist of tangible physical resources like public land and water, or intangible resources like information, music and data. A commons is not just an economic institution with a single metric of value, money. It is also a community of people that has its own rules for how a shared resource shall be managed and its benefits allocated.

It must be stressed at the outset that there are many different manifestations of commons. Just as “the market” is a generic term that may simultaneously apply to a hardware store, commodities future trading, and a lemonade stand, so a commons may describe land trusts, public libraries, open source software communities and scientific disciplines. No single definition can encompass all commons.

What makes for a successful commons? A flourishing body of literature in the social sciences, much of it associated with Professor Elinor Ostrom and her colleagues, is dedicated to studying the design principles, legal structures, institutional supports and social norms that undergird various commons. Their work helps us understand that sometimes the rules for a commons are formal and legalistic, as we see in the General Public License for software or the legal framework for Social

Security or the Alaska Permanent Fund. In other commons, the governance rules may be more informal and social.

One of my favorite examples of a commons comes from Professor Elinor Ostrom, who once showed a group a news photo of a shoveled-out parking space in Boston with a chair in the middle of it. “*This* is a commons,” she announced, explaining that there was a shared understanding in that neighborhood that if you shoveled out a parking spot after a big snow, you were entitled to park there until the snow melted. You signaled that right by putting an old piece of furniture in the cleared-out spot. There was a commons here because there was a *shared understanding* among a specific group of people about how use rights to a collective resource would be allocated.

The Commons and the Public Domain

Since much of our focus here is on intellectual property, let’s first distinguish the commons from the public domain. Historically, the public domain has been the term used to describe an open, non-commercial space of activity whose materials are available to all. In conventional legal discourse, the public domain has always been regarded as something of a junkyard filled with works of little value. After all, if no one can assert property rights in public-domain works, they can’t be sold for very much money. From the perspective of the market, they therefore must be worthless.

But in fact, the public domain – when seen as a commons – is a rich incubator of innovation and value. The problem is that, by the lights of neoclassical economic analysis, its value is not properly understood. The actual value-proposition of the commons has been eclipsed by the market’s ability to generate private, monetized wealth.

This mistake about valuation – that the market’s matrix of value is the only one that matters – encourages an over-propertization of the commons. I call this problem the “tragedy of the market.” Excessively broad property rights and monetization of resources are stifling innovation, competition and public access. My book, *Silent Theft: The Private Plunder of Our Common Wealth* (Routledge, 2002) describes the many realms of American life affected by “market enclosure.”

Intellectual property protection can provide significant and necessary incentives to creators and businesses to invest in new works. But increasingly, the propertization of knowledge is becoming an end in itself, disconnected from any concern with actual social outcomes.

Historically, of course, copyrights and patents have sought to stimulate innovation, the diffusion of knowledge and other social benefits. In American law, copyright and patent policies have tried to strike a balance between the legitimate needs of investors and owners on the one hand, and the needs of the public and other creators on the other hand.

Unfortunately, rights holders today – especially large “content industries” – like to talk about “intellectual property” as natural rights that have vast if not limitless scope. That’s why we increasingly have such absurdities as patents for mathematical algorithms, One-Click® online shopping and crustless peanut-butter-and-jelly sandwiches; trademarks for common words, colors and even smells; and copyright claims for sequences of yoga postures and silence as a “musical” performance.¹ Rights holders want to appropriate the considerable value residing in the commons for their own private purposes, even though unfettered public access to the commons may well be more efficient and productive.

The private appropriation of commons assets is not just a deplorable theft; it results in fundamental social inequities that become structural. We see this right now as multinational companies try to turn fresh water supplies into global commodities; as pharmaceutical companies claim property rights in ethnobotanical knowledge developed by indigenous peoples; and as broadcasters clamor for exclusive rights in portions of the electro-magnetic spectrum.

Market enclosure is now a pervasive trend eroding many valuable commons of creativity and knowledge. We see this trend in the multiple attempts to lock up and control commercial music and film at the expense of the public’s fair use and public domain rights. We see it in the “broadcast flag” proposal to encrypt digital television broadcasts; in laws against reverse-engineering and circumvention of encryption; in one-sided end-user licensing agreements for software and web content; and in treaty proposals to let webcasters “take private” works that are already in the public domain. I could provide a long list of such examples.

These topics deserve much discussion, but what interests me today is how a wide variety of online commons are asserting their own enormous power as a rival to the market. Notable examples include:

- open source software;
- listservs and collaborate websites;
- instant messenger, chat rooms and simple messaging systems (SMS);
- peer-to-peer filing sharing for research;

¹ These stories are told in my book, *Brand Name Bullies: The Quest to Own and Control Culture* (John Wiley, 2005).

- web logs & blog syndication;
- podcasting & videoblogs;
- wikis;
- massively multi-player online role playing games;
- social networking software based on metatags (LinkedIn, Friendster, Flickr, del.icio.us); and
- open repositories of public domain material like Internet Archive, Ourmedia.org.

The “public domain” as historically understood cannot begin to describe the actual generative power of these various commons. Intellectual property law has long regarded the public domain as an inert, fairly inconsequential body of archaic materials. Today’s online commons, by contrast, are potent sources of value in their own right. While a commons shares many of the same attributes as the public domain – most notably, open access and use, and the absence of individual property rights – the term “the commons” helps us describe the dynamic, organic social community that is the real value proposition of the commons.

The Power of the Commons

The idea that the commons may be a fertile source of value is perplexing to mainstream economists. It flies in the face of the “tragedy of the commons” myth that has so infected policy discourse. Most economists fail to recognize that information commons are not rivalrous, depletable resources in the same way that land is. As a result, they obsess about “free riders” appropriating someone else’s value -- when in the information economy, they should generally welcome the proliferation of positive externalities.²

Many economists are also uneasy with the idea that communities of people can generate meaningful wealth without the market apparatus. They also may not appreciate that networked communication managed by commons can be more efficient than markets in generating intellectual wealth and disseminating it. Exhibit A is Linux and open source software more generally.

Contrary to the tragedy of the commons narrative, a commons does not necessarily lead to waste, inefficiency or low value-added (as the term “public domain” implies). A well-designed commons can be tremendously efficient and

² Professor Mark Lemley explores this root fallacy in his article, “Property, Intellectual Property and Free Riding,” Stanford Law and Economics Olin Working Paper No. 291 (August 2004), <http://papers.ssrn.com/abstract=582602>.

creative in its own right *precisely because* there are no individual property rights, legal contracts or market relationships.³

The efficacy of a commons model is, in fact, a primary reason for the explosive growth of the Internet and the online commons mentioned above.⁴ As a June 2005 cover story on *Business Week* recently documented, many sectors of business are discovering the economic importance of “peer production” and other social forms of online value-generation.⁵ In fact, the largest and most successful businesses in the networked environment – Google, Yahoo, Amazon, eBay – are open platforms that self-consciously leverage the social propensities of people to cooperate through commons. They use chat rooms, reputation systems, recommendation and referral systems, and other “social software” to build business models “on top of” social interactions. Businesses are deliberately building their business models around the social dynamics of communities, whether these communities are players in massively multi-player games, job-hunting professionals, or hobbyists looking to connect with other hobbyists.

Commons, Innovation and Markets

The proliferation of electronic commerce can be directly attributed to the design of the Internet as an open commons. As Professor Lawrence Lessig explains in his book, *The Future of Ideas*, the Internet has been such a robust platform for innovation and commerce because it embodies “end-to-end” design principles that assure a non-discriminatory platform open to all: “[T]he end-to-end principle renders the Internet an *innovation commons*, where innovators can develop and deploy new applications or content *without the permission of anyone else.*”⁶ (emphasis in original) The principle of “network neutrality” built into the very architecture of the Internet means that no proprietary interest can “take private” one or another element of Internet content or web “traffic.” As a result, what is invented or contributed by participants to the Internet commons, remains in the commons.

My point is not just that the commons is a source of great value unto itself, but that the commons works in complicated ways to enable markets to work.

³ Yochai Benkler, “Coase’s Penguin,” 112 *Yale Law Journal* (Winter 2002-2003), available at <http://www.benkler.org/CoasesPenguin.html>; and Benkler, “Sharing Nicely”: On Shareable Goods and the Emergence of Sharing as a Modality of Economic Production,” 114 *Yale Law Journal* 273 (2004).

⁴ See, e.g., John Clippinger and David Bollier, “A Renaissance of the Commons,” which is Chapter 12 in *CODE: Collaborative Ownership in the Digital Economy*, edited by Rishab Aiyer Ghosh (MIT Press, 2005), pp. 259-286.

⁵ See, e.g., Robert D. Hof, “The Power of Us: Mass Collaboration on the Internet Is Shaking Up Business,” *Business Week* [cover story], June 20, 2005, pp. 73-82.

⁶ Lawrence Lessig, *The Future of Ideas: The Fate of the Commons in a Connected World* (New York, NY: Random House, 2001), p. 40.

Markets and commons are highly interdependent, and work in tandem. Let me briefly illustrate this fact through two creative sectors, music and fashion.

Music. Any great musical tradition – folk, jazz, rhythm and blues, rock, hip-hop – emerges over time through a community of musicians borrowing and adapting from each other.⁷ Musical traditions function as a commons, or as a special kind of commons, a *gift economy*.

A gift economy is a web of moral and social commitments within a defined community sustained by the giving of gifts (good, services, courtesies) without any assurance of personal return. But of course, participants in a gift economy *do* reap returns, simply by being members of the community. The fuzzy boundaries of “ownership” are precisely what enable the commons to work. Dizzy Gillespie showed his contempt for those who try to claim ownership of the music when he warned, “You can’t steal a gift.”

In its zeal to propertize music, however, the recording industry has always had trouble acknowledging the indispensable role of musical gift economies in constantly reinventing musical expression. Copyright law presumes that any marketable piece of new music is the “original” work of an individual, who should be entitled to exclusive rights to it.

But musicians know that Elvis Presley borrowed heavily from George Poulton’s “Aura Lee” to create “Love Me Tender”; that Led Zeppelin’s “Whole Lotta Love” is strikingly similar to Willie Dixon’s “You Need Love”; and that The Weaver’s “The Lion Sleeps Tonight” is directly based on a South African folk song, “Wimoweh.”⁸ This is how creative innovation works: newcomers stand on the shoulders of giants, as Isaac Newton famously put it, by adapting old standards to fit new sensibilities and needs.

Once markets begin to enclose a musical commons, however -- by making overly broad property claims – they begin to kill the Golden Goose. Property rights begin to shut down the un-metered flow of music and with it, the sharing and collaboration that keep it vital. Just listen to the sad state of popular music today.

⁷ See, e.g., Pete Seeger, *Where Have All the Flowers Gone: A Singer’s Stories, Songs, Seeds, Robberies* (Bethlehem, Pa: Sing Out Corporation, 1993); Dave Van Ronk, *The Mayor of MacDougal Street: A Memoir* (New York, NY: Da Capo Press, 2005); Olufunmilayo B. Arewa, *Musical Borrowing: From J.C. Bach to Hip Hop: Musical Borrowing, Copyright and Cultural Context*, SSRN #633241 (working paper, 2004).

⁸ David Bollier, *Brand Name Bullies: The Quest to Own and Control Culture* (Hoboken, NJ: John Wiley & Sons, 2005), chapter 1.

Fashion. Apparel design is built around a vast, churning commons that gives designers the freedom to use and transform motifs from nearly any cultural source.⁹ Most design elements are available to anyone to appropriate, copy, modify and sell without legal restriction. Designers do not need to ask permission or pay fees in order to innovate. They can draw from design elements throughout the culture and history. There are only the most minimal intellectual property protections for the designs of dresses, blouses, trousers and sweaters.¹⁰

Long lineages of couturiers from Balenciaga to Ungaro, Chanel to Lagerfeld, and Gucci to Tom Ford have shown that designers necessarily must learn and adapt from those who have blazed previous trails. If one were to deconstruct their work, an evolutionary chain of distinct themes, references, design nuances, and outright appropriations could be discerned.

Fashion thrives as an industry precisely because it has not enclosed the creative commons of fashion innovation. As Laurie Racine and I have written, “The ferment of new ideas and innovation is literally out of control, and beyond the ability of any single player to manipulate or dominate. As a result, everyone is too busy trying to stay ahead of the competition through the sheer power of her design and marketing prowess.”¹¹ Creative appropriation and transformation in the design commons are a key reason why fashion is such a robust, competitive global industry.¹²

The “non-ownership” of creative elements in a commons is crucial to innovation. It enables novel and unpredictable types of ideas to emerge. The open, experimental “white space” of the commons nurtures innovation, which eventually invigorates that which is developed and sold in the market. Professor Julie E. Cohen explains:

Creative practice is opportunistic, indiscriminate and centrally dependent on the borrowing and reworking of encountered objects and techniques. Creative practice is also fundamentally contextual,

⁹ This topic was explored at a one-day conference on January 29, 2005, which I co-organized with Laurie Racine, at the USC Annenberg School for Communication’s Norman Lear Center. The conference was entitled “Ready to Share: Fashion and the Ownership of Creativity,” <http://www.learcenter.org/html/projects/?cm=ccc/fashion>.

¹⁰ See, e.g., Jennifer Jenkins and Christine Cox, “Between the Cracks, A Fertile Commons: An Overview of the Relationships Between Fashion and Intellectual Property,” [essay], The Norman Lear Center, USC Annenberg School for Communication, January 29, 2005; and David Bollier and Laurie Racine, “Control of Creativity? Fashion’s Secret,” *Christian Science Monitor*, September 3, 2003, available at <http://www.csmonitor.com/2003/0909/p09s01-coop.html>.

¹¹ David Bollier and Laurie Racine, “Ready to Share: Creativity in Fashion and Remix Culture,” paper prepared for The Norman Lear Center, USC Annenberg School for Communication, January 29, 2005.

¹² Guy Trebay, “Imitation is the Mother of Invention,” *New York Times*, July 7, 2002.

social and relational....If we as a society want to facilitate the development of artistic culture, copyright doctrine should recognize rights of access to the common in culture to a far greater extent than it currently does.¹³

Markets can often work synergistically with the commons, adding their own types of complementary value – say, by identifying talent, or marketing it or distributing it. But markets also have an unfortunate propensity for using technology and law to enclose the commons, as discussed above. The over-propertyization of a creative social community results in the tragedy of the market that we are now enduring in so many areas.

The Enclosure of the Scientific Commons

One need only read recent books by Jennifer Washburn, Derek Bok, Sheldon Krinsky and Corynne McSherry to realize that a “market enclosure” of academic science is well underway.¹⁴ These and other critics argue that corporations are skewing university research priorities from long-term basic R&D to short-term, applied commercial research. They are demanding secrecy and publication delays as conditions of their partnerships, which in turn prevent other scientists from verifying findings and building upon the science. They are offering lucrative consultancies and stock equity plans for researchers, which introduce worrisome ethical conflicts-of-interest.

Universities, for their part, have barely recognized or addressed these perils, in part because many of them – the top research universities – have a keen conflict of interest. They are too busy patenting the discoveries of university scientists and entering into partnerships with large corporate sponsors. Science journalist Seth Shulman, author of *Owning the Future*, has warned, “Given the fierce expansion of market norms in academic research, the values of the technological commons must be actively championed to prevent them from eroding beyond recognition.”¹⁵

¹³ Julie E. Cohen, “Copyright, Commodification and Culture: Locating the Public Domain,” Public Law & Legal Theory Working Paper Series, Working Paper No. 663652, in P. Bernt Hugenholtz and Lucie Guibault, eds., *The Public Domain of Information* (Kluwer Law International, forthcoming, 2005/2006), available in draft form at <http://ssrc.com/abstract=663652>.

¹⁴ Jennifer Washburn, *University Inc.: The Corporate Corruption of Higher Education* (New York, NY: Basic Books, 2004); Derek Bok, *Universities in the Marketplace: The Commercialization of Higher Education* (Princeton, NJ: Princeton University Press, 2003); Sheldon Krinsky, *Science in the Private Interest: Has the Lure of Profits Corrupted Biomedical Research* (Lanham, MD: Rowman & Littlefield, 2003); and Corynne McSherry, *Who Owns Academic Work? Battling for Control of Intellectual Property* (Cambridge, Mass.: Harvard University Press, 2001.)

¹⁵ Seth Shulman, “Trouble on the ‘Endless Frontier’: Science, Invention and the Erosion of the Technological Commons,” [report] (Washington, D.C.: New America Foundation and Public Knowledge, May 2002), p. 20, available at <http://www.publicknowledge.org/resources/publications>.

Professors Michael A. Heller and Rebecca S. Eisenberg have shown how an expansion and fragmentation of individual property rights in a given scientific domain can end up paralyzing research innovation and, in turn, stifle the development of markets. They call this problem the “tragedy of the anti-commons.” This is a circumstance in which “multiple owners each have a [property] right to exclude others... and no one has an effective privilege of use.”¹⁶ An anti-commons exists when property rights are too numerous and fragmented to allow the commons to function.

Once an anti-commons emerges, write Heller and Eisenberg, “collecting rights into usable private property is often brutal and slow.” The search for treatments or vaccines for malaria is plagued by this problem, for example, because researchers cannot afford to clear the rights to dozens of research tools, proprietary reagents and software, etc. The dynamic is not confined to science, but also affects such fields as film-making, where rights-clearances for film excerpts can be extraordinary costly and administratively difficult to consummate, thereby impairing new creativity in film.¹⁷

Leveraging the Commons for Science

Many scientific commons are now being launched to avoid the many barriers to the free flow of information that markets tend to erect. Online commons enable universities, scientific disciplines and academic journals to honor and protect some basic values of science -- sharing, collaboration, open debate -- in the face of market pressures to restrict the circulation of valuable knowledge.

It helps to remember that scientific inquiry is fundamentally a creature of the commons, not the market. Academic science is driven by peer groups that govern themselves by their own professional ideals, standards and social norms.¹⁸ Market values are regarded as secondary and even hostile to the core mission of science.

¹⁶ Michael Heller, “The Tragedy of the Anti-Commons,” 111 *Harvard Law Review* 3 (January 1998); and Michael A. Heller and Rebecca S. Eisenberg, “Can Patents Deter Innovation? The Anticommons in Biomedical Research,” *Science*, May 1, 1998, pp. 698-701.

¹⁷ Pat Aufderheide and Peter Jaszi, “Untold Stories: Creative Consequences of Right Clearance Culture (Washington, D.C.: American University, 2005) [DVD and report]. The consequences of high transaction costs for rights-clearances was vividly illustrated by the celebrated documentary, *Eyes on the Prize*, about the U.S. civil rights movement. The landmark film threatened to fall into a “cultural memory hole” when the rights for news footage and other archival images used in the film expired. The producers had to raise some \$500,000 to renew the rights so that the film could be exhibited and sold in the future.

¹⁸ The sociologist Robert K. Merton is often associated with this perspective on science. See also, e.g., Warren O. Hagstrom, “Gift Giving as an Organizing Principle in Science,” in Barry Barnes and David Edge, editors, *Science in Context: Readings in the Sociology of Science* (Cambridge, Mass.: MIT Press, 1992).

As far as I know, no taxonomy has yet been devised for the many scientific endeavors (many of them Internet-based) that function as commons. Let me review for you the rich variety of scientific commons that I have identified. I distinguish them according to three general (and somewhat overlapping) features: 1) commons made possible by new software architectures; 2) commons based on innovative legal structures; and 3) institutional commons.

Software Architectures. Websites and web logs have proven to be the workhorses of networked communities. They are highly efficient vehicles for assembling, organizing, archiving and disseminating new information, and for hosting ongoing dialogue and debates. Many websites skillfully leverage decentralized “surplus capital” (unused computer CPU time) and volunteers to do important scientific work.¹⁹

An example: NASA’s Clickworkers invites Internet users to identify and classify craters on Mars based on satellite images of the planet’s surface.²⁰ The work, normally conducted by graduate students or scientists over the course of months, is now done for free, by thousands of Internet volunteers whose quality of work rivals that of trained geologists.

Wikis – a web application that allows anyone to add and edit content on a collaborative website – are also important vehicles for scientific collaboration.²¹ In essence, wikis enable a group of users to assemble, review and modify a body of writing in a cumulative way. Wikipedia may be the best-known wiki; it has compiled more than 600,000 articles in four years. But there are more than 1,000 public wikis out there and countless private wikis.

Wikis leverage the sharing and collaboration that lie at the heart of science, helping to develop some fundamentally different sorts of knowledge. I am particularly intrigued by the recently established Flu Wiki,²² which may come to rival the CDC and WHO in its ability to track the outbreaks and movements of flu viruses.

Peer-to-peer file sharing networks – better known for facilitating illegal music downloads -- are playing an important role in scientific research. The great advantage of P2P architecture is that it allows dispersed members of an online group to quickly and directly exchange data without relying on a central server. Far-flung participants from different institutions can thus be immersed in the same virtual working

¹⁹ See footnote 3.

²⁰ <http://www.clickworkers.arc.nasa.gov/top>.

²¹ Lambert Heller, “Wikis for Scientific Publishing,” <http://en.wikibooks.org/wiki/Wikimania05/Paper-LH1>

²² <http://www.fluwiki.com>

environment and collaborate much more effectively than they can in the more traditional networking structure of centralized computer servers and clients.

The new software architectures are literally making possible new forms of scientific inquiry and knowledge, such as computational biology.²³ As patents and copyrights assert proprietary claims over shared resources, enterprising minds within science are declaring that it may be time for an open source biology movement. I know of two important initiatives in this area; they are probably others.

Richard Jefferson's Australia-based group, Cambia, has been creating new non-proprietary research tools and technologies for more than a decade.²⁴ Its BiOS Initiative -- Biological Innovation for an Open Society -- develops and validates new means for cooperative invention of life sciences technologies. It recently launched a set of BiOS licenses, inspired by open source software licenses, that are intended to create a "protected commons," in which an invention can be improved by the ideas of many, without anyone patenting it.

The Tropical Drug Initiative, or TDI, is another experiment in open source drug development.²⁵ Its goal is to use the bottom-up, self-organizing methods of open source software to develop innovative new drugs. "With open and collaborative approaches, generally," says Duke Law Professor Arti Rai, one of the founders of TDI, "there may be room for creativity or the possibility of creativity that wouldn't come if you just had one pharmaceutical company working on a drug."²⁶

Innovative Legal Structures. Key to the success of commons-based solutions are legal licenses and structures that protect the integrity of the commons while enabling follow-on innovation and even commercialization. One of the most catalytic innovations in this whole area, of course, was the General Public License (GPL) for free software developed by the Free Software Foundation. It was the basis for open source licenses, many of which aloe the private commercialization of derivative code.

²³ One of the most advanced public initiatives in applying P2P architecture is Bioinformatics.org, the Open Lab at the University of Massachusetts, Lowell. This project provides decentralized networking tools to researchers so they can work together in solving information problems in bioinformatics. Bioinformatics.org has more than 14,000 members and 200 projects that it is hosting. In some ways, the very emergence of the bioinformatics discipline could not have occurred without computer networks and the commons they made possible.

²⁴ <http://www.cambia.org>

²⁵ <http://www.tropicaldisease.org>

²⁶ "Open Source: How Far Can It Go?" *Duke Law Magazine*, Fall 2004, pp. 30-32.

The GPL was an inspiration for the Creative Commons licenses developed for creative works and information.²⁷ The CC licenses are voluntary, private licenses that creators may use to notify potential users in advance that copyrighted works may be freely used in stipulated ways, often with commercial rights retained by the creator. A spinoff of the Creative Commons, the Science Commons, is now exploring analogous agreements for various scientific fields.²⁸

The Cambia BiOS licenses are another direct descendent of the GPL and Creative Commons licenses, albeit for patented technologies.²⁹ There are also open-source licenses for ongoing research conducted by the International HapMap Project, which maps variations in the human genome. Once data is completed, however, it is placed in the public domain, and any follow-on discoveries are eligible for patenting.

Besides licenses, we could stand some visionary legal innovations in implementing a meaningful development agenda that takes account of intellectual property policies. A good place to start would be to recognize the important role placed by the commons in spurring innovation, creating economic wealth and advancing social equity. This may be a difficult, long-term proposition, however, given WIPO's entrenched commitment to traditional IP paradigm.

In the meantime, I am intrigued by the proposed treaty for medical R&D that the Consumer Project on Technology and scores of scientists, health organizations and others have presented to the World Health Organization's Executive Board and the WHO Commission on Intellectual Property, Innovation and Health (CIPIH).³⁰ The treaty's backers point out that stronger intellectual property rights and high drug prices do create incentives to invest in medical innovation, but they also have serious unacknowledged costs: the rationing of access to medicine, misleading and costly marketing, barriers to follow-on research, and an aversion to risky basic research for innovative drugs and treatments for the poor.

The treaty proposal (which is too complicated to explain here) would go a long way toward financing new pharmaceuticals on a sustainable basis while making them more accessible and affordable to people, especially in developing countries.

Institutional Commons. Finally, many academic institutions and independent organizations are taking the initiative to create their own commons. M.I.T. has famously created its OpenCourseWare program to place all of its

²⁷ <http://www.creativecommons.org>

²⁸ <http://www.sciencecommons.org>

²⁹ <http://www.bios.net/daisy/bios/press.html>

³⁰ <http://www.cptech.org/workingdrafts/rndtreaty.html>

curricular materials online.³¹ At Brown University, the Decameron Web is a fascinating open web platform that brings together a vast global community of professors and students of all ages to study Boccaccio's *Decameron* in truly novel, interactive ways.³²

At Rice University, Connexions is an international, interdisciplinary “content commons” that provides free scholarly materials and a powerful set of free software tools to help authors publish and collaborate; instructors to build and share custom courses; and learners to explore the links among concepts, courses, and disciplines. It now has more than one million people from 157 countries tapping into over 2,500 modules. Almost 100 courses have been developed by a worldwide community of authors.³³

One of the most exciting developments in terms of institutional commons is the explosion in open access scholarly publishing. The Directory of Open Access Journals currently lists more than 1,700 scholarly and scientific journals that are published on an open access basis – a number that grows by several hundred every month.³⁴ Why should scientific disciplines and universities hand over their intellectual work to commercial journals – who then charge very high prices to publish it – when online commons can give the creators far greater control while enabling much broader distribution and citation, for free?

Open access journals have obvious benefits in stimulating the free flow of knowledge and collaboration. Scientific discoveries can more quickly be applied in clinical tests. The identification of promising research strategies and the rooting out of errors can move more rapidly. The benefits are especially important to developing countries, where timely and reliable medical knowledge may otherwise be locked up in expensive commercial journals.

The U.S. National Institutes for Health have helped legitimate the move to open access publishing with its recent requirement that federally financed research be made available under limited open-access rules. This trend is gaining further momentum now that the Wellcome Trust and Research Councils U.K. are also supporting open access publishing. This promises to catalyze sweeping changes in how scientific research will be disseminated and made accessible in the future.

³¹ <http://ocw.mit.edu/index.html>

³² http://www.brown.edu/Departments/Italian_Studies/dweb/dweb.shtml

³³ <http://www.cnx.rice.edu>

³⁴ <http://www.doag.org>. A premier source for timely news about the open access publishing movement is Peter Suber's blog, Open Access News, at <http://www.earlham.edu/~peters/fos/fosblog.html>

What's really interesting is how the open-access ethic is spreading to new and unexpected areas. For example, as publishers try to assert ever stronger control over their textbooks – to the extent of “renting” digital copies that “evaporate” after twelve months – a number of open-source textbook initiatives have arisen. These include the California Open Source Textbook Project,³⁵ the Open Textbook Project,³⁶ and Wikibooks.³⁷ There are also hybrid initiatives like BookPower,³⁸ whose ebooks are free to developing countries.

If there are any common denominators to these many science commons that I have mentioned, it is that each represents a social community – literally or figuratively – that is leveraging online networks to create and retain value. I realize this definition may stretch the meaning of the word “community” because in some instances the “community” may consist of strangers interacting impersonally. In such instances, the commons consists of a group of people with shared interests using the Internet as a hyper-efficient vehicle for creating valuable public goods (research, data, archives, indices, annotations).

The Commons and Intellectual Property Policy

The trends that I have sketched here have not fully crystallized. Nor are they fully integrated with each other. Nor are they widely recognized and understood. But many activities and forces associated with the commons are clearly converging. They offer some wonderful opportunities for diverse scientific and user communities to gain greater control over their own work, and to gain greater access to the information and culture of humankind.

The powers of open source software; the efficiencies of online commons; the growth of open access publishing; the rise of new types of software-based commons for research and learning; the new legal licenses for maintaining these commons; the new treaty ideas for facilitating the spread and use of knowledge – all of these trends are gaining momentum at the very moment when people's frustrations are growing at the rising costs, inefficiencies, inequities and barriers that conventional intellectual property regimes are imposing.

At the moment, this is a movement without a name. But there are enough straws in the wind for anyone to realize that a new paradigm of value creation is a-bornin'. It is posing significant challenges to our conventional understandings of how innovation and wealth occur.

³⁵ <http://www.opensourcetext.org/index.htm>

³⁶ <http://otp.inlimine.org>

³⁷ http://en.wikibooks.org/wiki/Wikibooks_portal

³⁸ <http://www.bookpower.org>

When Brazil threatens to break patents for AIDS drugs in order to fight that awful disease; when many national governments such as China and Brazil reject Microsoft products in order to embrace open source software as their national standard³⁹; when IBM gives away free access to 500 of its software patents in order to leverage open source communities⁴⁰; when highly respected legal theorists and nonprofit organizations propose commons-based strategies for overcoming patent problems,⁴¹ new types of international cooperation to finance drugs, and new IP regimes to stimulate development⁴²; when the benefits of open source software and open access publishing begin to fuel an open science movement,⁴³ as they have – all this suggests the beginnings of – if you’ll excuse the over-used metaphor – a paradigm shift.

I like to talk about the commons because it helps us recognize some inherent limitations of neoliberal policy discourse in understanding these phenomena. It helps us recognize and explain the growing benefits of sharing and collaboration via electronic networks.

To be sure, a commons is no magic formula. It must be properly designed and supported through public policies and other means – just as any functioning market must. A commons must devise certain rules and cultivate certain social norms for managing the shared resource. There must be transparency, and sanctions against free-riders. And so on. But current trends suggest that the commons has a very bright future indeed.

To talk about the commons is to recognize that there are other genres of solutions – beyond stricter IP controls – that deserve serious consideration. To talk about the commons is to acknowledge that our interests as market participants, whether as investors or consumers, are only one part of who we are as human beings. For all of its many practical virtues, we also care about social equity, openness, the consent of the governed, and the satisfactions that come from working cooperatively toward shared goals. The commons not only helps us acknowledge these other values, it helps up *operationalize* them. That may be its greatest appeal.

³⁹ Steve Kingstone, “Brazil Adopts Open-Source Software,” BBC News, June 2, 2005, at <http://news.bbc.co.uk/go/pr/fr/-/2/hi/business/4602325.stm>.

⁴⁰ Steve Lohr, “I.B.M. to Give Free Access to 500 Patents,” *New York Times*, January 11, 2005, p. C1.

⁴¹ Yochai Benkler, “Commons-Based Strategies and the Problems of Patents,” *Science*, August 20, 2004, pp. 1110-1111.

⁴² Joseph E. Stiglitz, “Intellectual property rights and wrongs,” http://www.dailytimes.com.pk/print.asp?page=story_16-8-2005_pg5_12&ndate=9/21/2005%205:54:54%20PM

⁴³ John Willinsky, “The Unacknowledged Convergence of Open Source, Open Access and Open Science,” *First Monday*, Vol. 10, no. 8 (August 2005), http://firstmonday.org/issues/issue10_8/willinsky/index.html.