

Leveraging the Commons to Foster Innovation, Access and Affordability

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Biotechnology and Intellectual Property:
Restructuring for the Public Benefit
McGill University, Montreal, Quebec, Canada
September 25, 2005

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 other domains such as science, the Internet, music, the visual arts, and even fashion. After reviewing several examples, I will focus on the benefits of the commons 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 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 value shall be generated and how a shared resource shall be managed and 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 successful 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, as when gossip and reputational sanctions help manage the commons.

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 -- is slowly sapping the vitality of many fields of scientific inquiry and creativity. 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 proprietization 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.

Nowadays, rights holders like to talk about “intellectual property” as natural rights of absolute scope. That's why we increasingly have such absurdities as patents

for mathematical algorithms, one-click shopping online and crustless peanut-butter-and-jelly sandwiches; trademarks for common words, colors and even smells; and copyrights for tattoos, yoga postures and even 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 aggressive new forms of digital encryption; in laws against reverse-engineering and circumvention of encryption; in one-sided end-user licensing agreements for software and web content; and in international treaty proposals to let webcasters “take private” works that are already in the public domain. I could provide an interminable 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;
- 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.

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

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 the problem of “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 of property rights, contracts and cash exchange. Finally, the realities of the Internet are still too novel for many economists to appreciate that networked communication can be far more efficient than markets in generating and disseminating wealth and innovation. 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 creative in its own right *precisely because* there are no individual property rights, legal contracts or market relationships.³

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>.

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).

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.

That’s one major arena – electronic commerce -- in which the commons is proving to be vital to innovation and market growth. 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

These new business opportunities would not exist but for the existence 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 in an online commons, remains in the commons.

My larger 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. Markets and commons are highly interdependent, and work in tandem. Let me

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.

briefly illustrate this fact through three creative sectors, music, the visual arts 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 that gift economies of musicians play. They have the conceit that any marketable piece of music is “original” and therefore belongs exclusively to an individual. 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, in Isaac Newton’s famous aphorism, by adapting old standards to fit new circumstances.

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, collaboration and innovation.

The visual arts. Creative derivation is an entirely natural and important strategy in any creative commons. Some of the most notable art movements of the 20th Century – Dada, Constructivism, collage, Bauhaus art, Pop art – are unabashedly appropriationist in nature. Artists such as Keith Haring, Kenny Scharf and Susan Pitt have used copyrighted cartoon characters. Roy Lichtenstein, Claes Oldenburg, Robert Rauschenberg, Andy Warhol and Larry Rivers are celebrated artists precisely

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.

because they appropriated and ingeniously recontextualized commercial images, often in subtle ways.

Culture could not exist without such interdependence on and borrowing from others. One can only imagine whether Duchamp could have produced his famous Dadaist parody of da Vinci's "Mona Lisa" today. Da Vinci's estate would probably sue for copyright infringement because the parody used a total, verbatim "quote" of the Mona Lisa.

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 There are only the most minimal intellectual property protections for the designs of dresses, blouses, trousers and sweaters.¹⁰ 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. 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.

I believe that 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 are a key reason why fashion is such a lively creative commons and such a robust, competitive, constantly changing marketplace.¹²

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.

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 is an important force for innovation in markets. 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, 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 the best talent, marketing and 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 Krimsky 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.

Universities are aggressively patenting university discoveries and entering into partnerships that dictate research priorities and methods. Companies 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. Companies are offering lucrative consultancies and stock equity plans for researchers, which introduce worrisome ethical conflicts-of-interest. Science author Seth

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 Krimsky, *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.)

Shulman 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

Two intellectual property 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 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

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

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>.

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 continue to be exhibited and sold.

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. The perils of market-based science can be seen in the pharmaceutical industry, where companies deliberately warp objective science through their sponsorship of research, generous junkets and consultancies, marketing tactics, and so on.

Leveraging the Commons for Science

By now, I hope it is clear that the commons is a value-proposition at least as important as – but intertwined with – the market. While markets and private property will always play an important role in stimulating innovation and material progress, let us recognize the distinctive role of the commons in fostering its own types of innovation. Even better, a commons is designed to enable broad public access and affordability.

As far as I know, no taxonomy has yet been devised for the many scientific endeavors that function as commons. So let me review for you the rich variety of scientific commons that I have identified. Four general features distinguish them: 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. An example: NASA's Clickworkers invites Internet users to identify and classify craters on Mars based on satellite images of the planet's surface.¹⁹ 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.

The Human Genome Project pioneered annotation software.....

Wikis – a web application that allows anyone to add and edit content on a collaborative website – are also important vehicles for scientific collaboration.²⁰ 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

¹⁸ The sociologist Robert K. Merton is often associated with this perspective. 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).

¹⁹ <http://www.clickworkers.arc.nasa.gov/top>.

²⁰ Lambert Heller, "Wikis for Scientific Publishing," <http://en.wikibooks.org/wiki/Wikimania05/Paper-LH1>

more than 600,000 articles in four years. But there are more than 1,000 public wikis out there and countless private wikis. I am particularly intrigued by the potential of the Flu Wiki in tracking 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 environment and collaborate much more effectively than they can in the more traditional networking structure of centralized computer servers and clients.

The software and networking is literally making possible new forms of scientific inquiry and knowledge, such as computational biology.²¹ Naturally, this is leading inquiring minds to ask if it is time for an open source biology movement? I know of at least two important initiatives in this area.

Richard Jefferson's Australia-based group, Cambia, has been creating new non-proprietary research tools and technologies for more than a decade. 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 capturing it from themselves through a patent.

The Tropical Drug Initiative, or TDI, is another experiment in open source drug development. Its goal is to use the bottom-up, self-organizing strategies 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."²²

²¹ 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.

²² "Open Source: How Far Can It Go?" *Duke Law Magazine*, Fall 2004, pp. 30-32.

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 patenting in stipulated ways. For example, the International HapMap Project, which maps variations in the human genome, uses an open-source license for ongoing research. But data that is completed is placed in the public domain; any follow-on discoveries are eligible for patenting.

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 that allowed greater flexibility of use, including the private commercialization of derivative code.

The GPL was an inspiration for the Creative Commons licenses that were developed for creative works and information. The CC licenses are voluntary, private licenses that creators may choose to notify potential users of their works that they 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 analog agreements for scientific and patent fields.

The Cambia BiOS licenses are another direct descendent of the GPL and Creative Commons licenses, albeit for patented technologies.²³ Cambia has developed another useful tool, the Patent Lens, which includes the world's largest free full-text searchable life sciences patent database. The idea is to make the world of patents more transparent so that innovators can develop new tools confident that they are not infringing on someone's patent.

Besides licenses, we could stand some visionary legal innovations in revamping TRIPs and implementing a 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 and its rejection in

In the meantime, I am intrigued by the proposed treaty for medical R&D that has been presented to the World Health Organization's Executive Board and the WHO Commission on Intellectual Property, Innovation and Health (CIPIH).²⁴ The treaty's backers point out that stronger intellectual property rights and high drug prices do create incentives to invest in medical innovation, but it also results in the

²³ <http://www.bios.net/daisy/bios/press.html>.

²⁴ <http://www.cptech.org/workingdrafts/rndtreaty.html>

rationing of access to medicine, misleading and costly marketing, barriers to follow-on research, an aversion to risky research on breakthrough drugs, and little basic research on treatments for the poor. The innovative 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 curricular materials online. At Brown University, the Decameron Web is a fascinating web archive of materials which is used to bring together a vast global community of professors and students of all ages to study Boccaccio's *Decameron*.²⁵

At Rice University, the 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 are tapping into over 2,500 modules and almost 100 courses developed by a worldwide community of authors.²⁶

One of the most exciting developments in terms of institutional commons is the explosion in open access scholarly publishing. Why should scientific specialties, academic disciplines and universities hand over their intellectual work to commercial journals – who then charge very high prices to publish it – when online commons give the creators far more control over their published work while enabling much broader distribution and citation, for free?

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 a limited form of open-access rules. This trend is gaining further momentum now that the Wellcome Trust and Research Councils UK (RCUK) 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. 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.²⁷

²⁵ http://www.brown.edu/Departments/Italian_Studies/dweb/dweb.shtml

²⁶ <http://www.cnx.rice.edu>

²⁷ <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>

Open access journals has obvious benefits in stimulating the free flow of knowledge and collaboration. Their benefits are especially important to developing countries, where timely and reliable medical knowledge may be locked up in expensive commercial journals.

What's really interesting is how this 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 12 months – a number of open-access textbook initiatives have arisen. These include the California Open Source Textbook Project,²⁸ CommonText, the Open Textbook Project,²⁹ and Wikibooks.³⁰ There are also hybrid initiatives like BookPower,³¹ whose ebooks are only free to developing countries

If there are any common denominators to these many science commons that I have mentioned above, 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, data annotations).

The Commons and Intellectual Property Policy

The trends that I have sketched here have not fully crystallized. Nor are they widely recognized. But they are converging, and they offer some wonderful opportunities for diverse communities of interest 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 research commons based on innovative software architectures; the new legal licenses and structures for maintaining these commons – all of these trends are gaining momentum at the very moment when people's frustrations are growing at the costs, inefficiencies, inequities and barriers to innovation that conventional intellectual property regimes are imposing.

²⁸ <http://www.opensourcetext.org/index.htm>

²⁹ <http://otp.inlimine.org>

³⁰ http://en.wikibooks.org/wiki/Wikibooks_portal

³¹ <http://www.bookpower.org>

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

CONCLUSION

On the other hand interconnectivity and open access to many old and new journals enhances the synergism between science disciplines as well as basic and applied science. It will speed the translation of scientific discovery into relevant clinical applications, and perhaps quicken the selection of the “fittest” tools for cure disease and optimize health and treatment.

There is great value simply in *talking* about the commons because it helps us recognize some realities that neoliberal policy discourse tends to discount: that non-market sharing and collaboration and can be rich, practical incubators of value in their own right. To be sure, an effective commons must be properly designed and supported through public policies and other means – just as any functioning market must. There must be certain rules for governing and managing a commons. There must be transparency, and sanctions against free-riders.

Once we acknowledge the coherence of the commons as a concept and the deep appeal of its values, we can begin to legitimate new private initiatives and public policies to build and protect the commons.

Science progresses only because scientists are free to draw upon the knowledge of predecessors and peers without impediment.

There is a presumption of non-proprietary access and transparency in the scientific commons because that is the best way to identify error and fraud, replicate and refine experimental results, and to enable new ideas to be introduced. As we will see below, restrictions on the flow of knowledge – whether through intellectual property, secrecy, or censorship – harm the ability of science to progress.³²

overviews of why & how non-market sharing and collaboration are vital in these fields, and how they do not preclude, but enhance, the long-term vitality of markets. More on science below.]

³² The Creative Commons recently launched a Science Commons project to help maintain the open sharing that is central to the scientific enterprise (<http://sciencecommons.org>).