From Lobsters to Universities: The Making of the Knowledge Commons

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ABSTRACT

Philosophers and social scientists from Hobbes to Hayek have debated the necessary and sufficient conditions for the making of states and markets, but there has been a remarkable lack of interest in the making of commons. This *terra nullius* of discourse is especially problematic when considering the making of the all important knowledge commons. In this paper I explore the making of a functioning commons off the coast of Maine ("the lobster commons") and draw lessons from this process in exploring what would be the conditions for the making of the knowledge commons and the role universities can play in this making.

Introduction

In this paper I address the practical task of actually making the knowledge commons. I examine this project in two parts. The first part is a discussion of the typical difficulties encountered in the making of commons in general. In order to concretize this theme, I analyse the making of the "lobster commons" on the coast of Maine over the last hundred and fifty years. The methods of lobster fishing developed by Maine lobstermen and women have become a textbook example of how a group of people who are not altruistic angels can come together to self-manage the exploitation of a common resource without exhausting it or destroying each other.

Once we become sensitized to the difficulties in the making of commons in general, I shall turn to the question of the knowledge commons in particular. This, however, is not a simple, logical transition from general to particular. Knowledge is a peculiar common good since it is neither located in any geographical site nor is it a "natural resource" as are most examples of common-pool resources in history (lands, forests, aquifers, fishing grounds, etc.). Knowledge is everywhere and nowhere.

Indeed, knowledge is a peculiar example of a distinctive common resource called a "global commons."

I then analyse a number of typical problems that the constituent community of the knowledge commons, especially universities, their faculties and students, must face in preventing a "tragedy of the knowledge commons."

Communal Lessons Taught by Maine's Lobster Gangs

What is required to make a knowledge commons, or indeed, any commons at all? Commons require at least three elements for their constitution: (i) a common-pool resource, i.e., a resource that combines "difficult excludability" and "high subtractibility," (ii) a set of people who desire continuous, long-term access to the resource ("commoners"), and (iii) procedures to arrive at a set of rules that commoners use to manage the resource.[1] Any attempt to go from this abstract framework to actual commons with specific resources, people, and rules, often leads us to examples of either historical interest—e.g., evoking the cosy village commons in medieval England (redolent of Tolkien's Shire)—or "exotic" locales, e.g., small communities in the forests of contemporary India.[2]

An example of a commons that is neither cosy/historical nor exotic is the world-famous commons on the Maine coast from Kittery to Eastport that constitutes in area one of the largest commons on the planet. The common-pool resource is composed of the millions of lobsters living there; the commoners who desire access to these lobsters are the thousands of lobstermen (and a few lobsterwomen) whose livelihood is based on selling the results of their lobster fishing; and the set of rules and procedures they use to manage the lobster fishery is a complex combination of informal deals among the lobstermen, the state of Maine and US government laws and their agents. It is a rather remarkable feat of co-management between the commoners and the government that is responsible for the survival and success of the lobster industry at a time when other types of fishing in the Gulf of Maine, organized largely through open access rules, are facing extinction.

The present management of the lobster commons is based on the Zone Management Law of 1995 that gave legal authority to a pre-existing informal territory-based system of access to local gangs.[3] The law divides the Maine coast into seven segments in which each segment has its zone council made up of elected lobstermen who deliberate on issues such as trap limits, the permissible size of lobsters taken to market and licensing procedures in their area. The councils also arbitrate the inevitable dis-

putes that come with lobster fishing. The most prominent ones being, of course, boundary disputes both among individual lobstermen in a zone and inter-zone conflicts between gangs.

No lawgiver from Maine devised the present settlement of lobster fishing that is based on the participants' self-management of the fishery. It arose out of more than a century of struggle among lobstermen themselves and between them and Maine and US government officials. The making of this common was not irenic, but nor was it a bloody tragedy. Consequently, it is worthwhile sketching its history to illustrate how an actual commons is made.

This process had at least three stages. The first was a purely territorial one. For example, someone who owned an island or a home on the coast presumed to have the surrounding waters as his own fishing turf. Consequently, "the first fishing territories were small, close to shore, fished mainly in the warm months of year, and vigorously defended by their owner or owners, who were usually close kin."[4] The battles to preserve these small areas mostly involved trap molestation, often by cutting traps' buoys and warp lines or destroying all or part of them, and had the quality of a Hobbesian war of all against all.

In the second stage, harbour or island gangs organized the territory on the basis of the geographical features of the area they lived in. The average tourist looking over a Maine bay would not see what the lobstermen saw: the dividing lines separating the territory allotted to the members of a harbour gang and between different harbour gangs. These gangs also carefully controlled the entry of new lobstermen, and often rejected claimants by destroying their traps or in one way or another harassing them until they left the fishery.[5]

In both these stages a set of territorial, access, and entry rules were informally created (and enforced) by individual lobstermen or by harbour or island gangs. This was the period when the commons was formed. The third stage has been one where a confrontation between commons and the state initiated a gradual shift leading to the introduction of formal rules negotiated by lobstermen and the Maine state and federal governments. This process has been aided and abetted by the increase in law enforcement (e.g., stiffer penalties for trap molestation) and an expansion of lobster fishing into the open sea where traditional and legal territorial claims largely disappear.[6]

What has been the most important factor in the formation of the lobster commons has been the change in lobstermen's attitudes before and after the cataclysmic developments in the 1930s when lobster catches went to historic lows. Colin Woodward describes the lobster industry as heading straight to a "tragedy of the commons" in the 1930s:

Between 1905 and 1929, Maine lobstermen increased the number of traps they used by 62 percent and fished over ever-longer seasons, but their catch fell by 28 percent. Only the ever-increasing prices kept an economic disaster at bay. The stock market collapse of 1929 dealt the final blow to the industry ... Lobsters were by then an expensive luxury item, and both demand and prices crashed during the Great Depression of the 1930s.[7]

The lobstermen in the 1930s discovered a resistance to their livelihood that required a collective response. They realized that their individual violations of conservation laws were leading to a collective catastrophe. As Acheson notes: "[I]ncreasingly, people became convinced that those violating the conservation laws were doing far more damage than they had thought previously."[8]

The period since the 1930s has seen a remarkable reversal. "By the 1990s," writes Acheson, "the lobster conservation laws became almost self-enforcing."[9] In many cases this trend was further intensified. For example, between 1997 and 1998 all the seven lobster management zones voted on trap limits, i.e., the maximum number of traps an individual lobsterman can operate. This was meant as a conservation measure and was heavily supported even though it led to a sharp division in the various harbour gangs between the big fishermen and the others.

The success of this conservation ethic and the co-management of the lobster fishery has become evident in the industry's survival and even flourishing, or, at least, its holding its own in the recent energy price jump and financial crash. Thus we have an example of a more than century-long making of a commons. What does it teach us about the constitution of a knowledge commons?

Certainly the experience of the Maine lobstermen encourages a healthy scepticism towards both top-down governmental and short-term market approaches to management of common resources. As the doyen of the academic study of common property resources, Elinor Ostrom, concludes: "[A] frequent finding [of studies of the commons] is that when the users of a common-pool resource organize themselves to devise and enforce some of their own basic rules, they tend to manage local resources more sustainably than when rules are externally imposed on them."[10]

Indeed, the commons operates in the conceptual *terra nullius* between market and government; hence the process of its making has to be different from the makings of the market and the government.

Let us consider three central features required in the making of the lobster common: (i) increasing the shadow of the future, (ii) training in communal values, and (iii) struggling against both the anti-communal restrictions of the state and the temptations of the market.

First, increasing the "shadow of the future" on the present is crucial for the making of a commons. In our case, this has two elements: the future shadow of the lobsters and the future shadow of the lobstermen. Lobstermen deal on a daily basis with other lobstermen who are largely local residents and whose livelihoods will depend upon their access to an abundant stock of lobsters far into the future. Moreover, they expect to communicate with and to make deals with other potential competitors concerning the lobster stock in the future. This situation allows them to escape from the infernal difficulties of the Prisoner's Dilemma.

So if someone breaks the evolving rules of the commons, especially conservation laws that affect the future stock of lobsters, she can expect that the others will know and break off co-operation with her. Given the need for continual interaction on the sea, this could be a heavy burden. Certainly, this is the case in Maine where trap molestation is a constant threat while social sanctions and ostracism of defectors can "be more effective than a dozen wardens."[11]

Second, the training of the values of co-operation and reciprocity are important in the making of a commons, since they frame and weigh on the decisions concerning whether to co-operate with or defect from the rules of access and contribution to the common resource.[12]

This is clearly seen in the informal apprenticeship served by all who enter into Maine lobster fishing, for it is an artisanal industry that requires enormous communal efforts, especially in times of immediate danger, from storms to border defence. Lobstermen's communities, or gangs, carry on this education in values and skills and in the process they have created a remarkable social system over many generations. By creating a distinct "moral economy," this system has survived both economic and ecological crises, while simultaneously supplying the international market and exploiting a species that occupies a very fragile niche in the Atlantic's ecology.[13]

Third, the commons needs to be valorized. Academic students of the commons know this process as "changing the payoffs," for all too often the state criminalizes communal co-operation and the market tempts many to break communal bonds and limits. Together they often prevent commons from forming, so it is at this point that the struggle with the state and capital is especially pronounced in the drama. Consequently, it is important to end the criminalization of pro-commons behaviour and to show that following the commons' rules leads to prosperity and not economic suicide.

The confrontation with state and capital in the making of the commons is especially clear in Maine's lobster industry. For almost a century many of the daily activities of the lobstermen and -women—from territo-

rial defence to the harassment of unwelcome newcomers—were considered violations of law that carried heavy penalties. It was only after the passage of the Zone Management Law of 1995 that these practices were transformed into the realm of quasi-legality. For example, "in 1999, the zone councils were ... empowered to make proposals to limit the entry of new fishermen into their zone as older license holders retired."[14] Similarly, the market continually tempts those fishermen with a lot of capital to employ ever-larger boats with many crewmembers to over-fish. This has led to something of a class struggle within the lobster fishing communities between the "big" and "little" ones in an attempt to forestall the inevitable working-out of the market's logic. Before the 1995 law there were many informal efforts to impose trap limits with all the tensions and dangers such efforts imposed, but in the late 1990s formal, state-sanctioned, and locally voted upon trap limits were installed throughout Maine.

Is the Making of the Knowledge Commons Possible?

With the general notion of a commons and a concrete example of the making of Maine's lobster commons established, I now turn to the question of the making of the knowledge commons and universities' involvement in that process. According to the general definition of a commons, at least three elements are necessary: (i) a common-pool resource; (ii) a community that accesses the resource; (iii) a set of rules for accessing the resource and meta-rules for making these rules. A number of oddities and paradoxes posed by the notion of the knowledge commons must be successfully addressed before we can actually engage in its making in a clear-headed manner.

The first difficulty is with the resource itself: knowledge. Knowledge as a common-pool resource constitutes texts, concepts, images, and sounds encoded and stored in a variety of forms—from binary electro-magnetic states, via ink and paper, to vinyl, magnetized tapes, or film, or even stone inscriptions. Although made up of individual points of access (often called commons as well), it is a vast (potentially infinite) expanse that includes anything from the languages of the ancient Mayans to the address of a local restaurant. This resource ontologically differs from the stock of lobsters on the coast of Maine. After all, the common-pool resource in the case of the lobster commons is spatially and temporally specific and has a relatively well-known process of reproduction. Knowledge has no defined location in space and time, its mechanisms of accumulation are not well known and it spans the material/immaterial, the abstract/concrete, the specific/general, and many other divides.

In other words, the totality of knowledge is hard to grasp, but *pace* the Maine Lobstermen's Association, it is infinitely more important for human existence than all the lobsters on the coast of Maine. In fact, it seems to escape from control by any particular government in the way global commons like the atmosphere, the oceans, and outer space do. Similarly, the market, or capital, is incapable of subsuming it since the market itself requires this commons to operate, primarily in the form of the background information required for each market transaction. Hence the power relations between these commons and the state and market differ profoundly—while the lobster common is pressed on each side by state and market, the knowledge common transcends and is a pre-condition of both. Finally, the end of the lobster commons is to allow the commoners to make enough money to support their needs through selling a commodity to a distributor; whereas the end of the knowledge commons is the accumulation of a common good that is neither monetary nor the source of livelihood of any particular community to the exclusion of others.

The immensity of the epistemic resource combined with its partial lack of tangibility makes it similar to language (given Saussure's distinction between *langue* and *parole*[15]) that also has a status of a potentially infinite resource (since any grammar of a human language can generate an infinite number of grammatical sentences). Just as language is a product neither of government nor market, but an immense diurnal communal production of millions of speakers, listeners, readers, and writers, so too is knowledge a vast communal product being produced prodigiously on a daily basis. Just as one would be foolish to refuse to acknowledge the wealth of the gift of language because it is unruly and transcendent, one would be equally foolish to refuse to recognize the wealth of knowledge because it too is unruly.

Yet, however vast, wild, and transcendent it is, knowledge is increasingly being privatized and commoditized. Consequently, the powerful political charm of knowledge's low subtractability,—i.e., my use of an item of knowledge does not deprive you of its use—is being challenged by corporations and states. Corporations are using copyright and patent law to make people pay to use an item of knowledge that had previously been in the public domain, hence creating an artificial scarcity and increasing its subtractibility. States are increasingly using their powers of secrecy and surveillance to make it possible, on the one side, to know that you and I know a particular item of knowledge and, on the other, to keep us ignorant of its knowledge of our knowledge. Together these transformations of knowledge, which reached a new maturity recently, create the need to protect the non-state and non-market access to knowledge as a resource for life, and set the stage for the knowledge commons.

A second difficulty arises with the community managing the knowledge commons. "No commons without community" is an axiom of commons studies on both the Right and the Left.[16] In the case of the Maine lobster commons, there has clearly been a specified community managing the common-pool resource for about a century and a half: the harbour and island gangs. They have gone through many changes in number, equipment, self-definition, and attitude, with the crisis of the 1930s perhaps bringing about the most decisive changes, but they have provided a continuity of work and concern, since lobster fishing has been the basis of their livelihood in some cases for generations. But what is the community of the knowledge common? Is it the set of human knowers? If so, then it must include all of humanity. If not, then what subset of humans is distinctly involved in the management of the resource knowledge? The intellectuals, the academics, or the literate? None of these subsets seem correct, but then what is a commons that includes all of humanity? Is humanity a community?

These are pertinent questions and they pose conundrums galore, but they cannot be escaped by rejecting global solutions provided by global governance *tout* court. For just as environmental groups like Greenpeace must challenge the crimes of oil dumping and the killing of nearly extinct whale species that take place on the high seas far beyond the reach of local communities, so too must the access to the resource of knowledge be dealt with as a totality. It is true that at the moment most "global solutions only serve as a legitimation of a capitalist and imperial power."[17] This does not mean, however, that there cannot be ways of struggling on a global level that matches the logical level of the knowledge resource and in the process creating the type of communication and reciprocity that is an essential prerequisite for the creation of a coming human community. This indeed is happening with a number of efforts to create new forms of communal ownership and communication of knowledge—from the Creative Commons licenses, to free co-operation, open access, file sharing, peer-to-peer networks, etc.

A third difficulty arises from the rules of access and contribution to the common resource of knowledge. The rules that were developed in the lobster commons (V-Notching, double gauging, escape venting, etc.) were devised as part of an effort by the lobstermen to both remain economically viable and escape from the tragedy of the commons, i.e., the rules were functional to keeping the stock of lobsters large enough to sustain profitable catches. But what is the point of the rules for access and contribution for the knowledge common? How can rules be devised to avert the tragedy of the knowledge commons? Indeed, what is the "tragedy" in this case?

The true tragedy of the knowledge commons is the absorption of the totality of knowledge into the realm of state administration or market commodification. Consequently, the aim of the rule-making by the community of the knowledge commons is the creation of collective forces and practices that can prevent the overwhelming enclosure of the commons by state and market. The criterion for evaluating a successful set of rules would be both whether the realm of free access to knowledge increases and whether the contributions to knowledge creation increase as well.

Of course, knowledge is both an end and a means to an even higher end: the liberation of humanity from oppression. How the possible conflicts between knowledge as a means and an end are to be adjudicated is the ultimate question. But before we can anticipate this question, we must first examine how to make the knowledge commons.

The Making of the Knowledge Commons

In the previous sections we examined how other commons, including the lobster commons of Maine, were made and noted three considerations as essential to the making of a commons: increasing the shadow of the future, commoners learning commons values and practices and changing of the pay-offs for co-operation. We shall apply this scheme to the making of the knowledge common.

a. Increasing the "Shadow of the Future"

The shadow of the future element is the apocalyptic or revolutionary crisis moment in the making of the knowledge common. A mental temporal reversal that projects a future total enclosure of knowledge by both state and market on to decisions made today, is required in order to motivate the type of mass co-operation needed for the creation of the knowledge commons. Ironically, the combination of the war on terror surveillance and the maximization of neoliberal intellectual property policies of the last decade, has unleashed the social imaginary that is gathering force in the present social and economic crisis. It may well be that this period will become for the knowledge common the equivalent of what the 1930s was for the making of the Maine lobster common.

There is now a generalized sense of crisis with respect to the access of knowledge being voiced across the intellectual spectrum. Phrases like "the enclosure of knowledge," "the crime of reason," "the tragedy of the anti-commons," and "the silent theft of the knowledge commons," have become shibboleths of a movement that, like the ecological movement of the 1960s and 1970s warning of climate change, is now envisioning the

complete commodification and/or sequestration of knowledge.[18] Let me review a small sample of this prophetic literature.

One of the most salient recent expressions of the extremity of our epistemic situation is by Noble-prize winning physicist, Robert B. Laughlin. He claims that the national security restriction on research as well as the patenting and copyrighting of knowledge has increasingly criminalized the exercise of reason and the pursuit of learning. This development justifies his introduction of his catch phrase, "the crime of reason," into the discussion of the contemporary epistemic scene. He writes:

> Our society is sequestering knowledge more extensively, rapidly, and thoroughly than any before it in history. Indeed, the Information Age should probably be called the Age of Amnesia because it has meant, in practice, a steep decline in public accessibility of important information.[19]

Laughlin sees in the "criminalization of learning" a profound contradiction between the desire to give to the market and state powers to achieve their purported ends for the greater good and the lingering respect for one of the most basic of human rights: the right to know. This desire and respect are now in contradiction. The consequences of the situation described by Laughlin's epigram, "the Age of Reason is being pushed out of its ecological niche by the knowledge economy," will only be fully felt in the future, but he argues that action to avoid it must begin now and that action will be costly (for many corporations) and dangerous (for many states).

David Bollier, a journalist and media activist, prophesizes that we are on the verge of a "copyright police state." He writes:

> Copyright owners want strictly to control their creative and informational works—in all markets, on all media platforms, and even in how people can use copyrighted products. This is propelling an unprecedented expansion in the scope and duration of intellectual property protection, as well as more intrusive kinds of enforcement and new technologies of control.[20]

In effect, there is an ongoing "silent theft" of the dozens of resources that us citizens collectively own, from public forests to the electro-magnetic spectrum, but with special emphasis on the knowledge commons. "big content" computer and Internet corporations are the "silent thieves" who are enclosing and privatizing the immense wealth developed by thousands of generations of "knowers" without firing a shot.

Finally, consider the vision of Nancy Kranich, former president of the American Librarians Association, who claims that the impression of increased availability of knowledge during the Internet era is an illusion. She writes:

[E]ven though more people than ever have access to computers and the Internet, much valuable information is being withdrawn, lost, privatized, or restricted from the public, who used to be able to rely on this same information. In effect, this "walled garden" or "enclosure" online creates an increasing threat to democratic principles of informed citizens and academic principles of building on the shoulders of giants. Looks are deceiving: while it appears that we have more, we actually have less and less.[21]

It is difficult to assess her quantitative claims (is it more or less?), but the evidence she brings to bear on her prophecy is impressive. For example, she points out that libraries that subscribe to a database have nothing to offer users if they discontinue leasing, even if they had paid fees for decades, due to restrictions on archiving and preserving the material on the database. "When budget cuts come," says Siva Vaidhyanthan, "the library has no trace of what it bought: no record, no archive. It's lost entirely."[22] Do we have more data now and less later?

These individual voices are joining many others to cast the shadow of the future onto the present. They are beginning to become self-conscious and are slowly forming a collective force, i.e., a movement. These prophets' hellish visions of an electronic, free market, Fahrenheit-451 world are echoed by the practical efforts of some universities and "knowledge rights" organizations that are challenging both the legal and administrative repression of free access to the knowledge commons.[23] These overt efforts to resist the growing privatized/securitized knowledge order are but observable peaks in an ocean of billions of acts of epistemic subversion that have become commonplace in the life of university faculty members and students. Together these developments constitute a growing movement of resistance to the complete neoliberal and national-security state destruction of the ever-nascent knowledge commons.

This movement is posing a number of unavoidable questions, especially to universities because they are the institutions that present themselves both as providing the preliminary training required to access knowledge and as expanding the dimensions of the knowledge commons through scientific and scholarly research and artistic creations. University administrators, faculty and student can no longer avoid responding to questions like:

- Will universities be advocates for open access to the knowledge commons?
- Will universities require that their faculty members make their research results available in the public domain?
- Will faculty members self-archive the products of their research and demand that their work be available in the public domain?

These are not easy questions to answer, mainly because they put into doubt the economic strategy of most universities in the neoliberal era. If answered affirmatively, for example, they will put universities in conflict with content providers like publishing, television, and film companies as well as internet providers. Unless driven by a vision of a catastrophe, the universities would lack the energy to deal with the resistance of these providers.

b. Training in Communal Epistemic Values

The second aspect of the making of the knowledge commons that is relevant here is the training of commoners in communal epistemic values. Historically, the creation of knowledge has been a social and even global process, as we now realize, but the ideology of individualism is still dominant in education. Learning as a singular enterprise has been the centre of bourgeois philosophy of education and still has a residual power to this day. "Is this your work?" is the primary question of assessment and the violation of the rule of isolated self-creation is the primary sin for this philosophy even though it has been clear since antiquity that knowledge is a collective product. The power of this individualistic paradigm, however, is now giving way to a collective methodology of knowledge production.

This kind of training in communal epistemic values is now becoming inherent in the prevailing models of knowledge production. David Bollier writes:

> From libraries to biotech researchers to musicians, many groups are coming to recognize the value of their own peer-based production and understandably wish to fortify and protect it. In one sense, this is simply a rediscovery of the social foundations that have always supported science, academic research, and creativity. The scientific research community has long honored the sharing of knowledge and resources, open dialogue, and sanctions against fraudulent research. For years, academia has flourished with the same ethic of sharing and openness among the members of a self-governing community. The creativity of jazz, the blues, and hip-hop has always been rooted in musical communities and intergenerational traditions that encouraged borrowing, emulation, and the referencing of works by other artists.[24]

These communal epistemic values Bollier refers to have become integrated in the technology of our time. How often do we begin our research on a listserve that makes it possible for us to coordinate our thoughts and knowledge with multiple interested others as if we were in the same room? Similarly, we have all been involved in information and file-sharing in networks that stretch across continents. Indeed, the co-operative training of factory workers that Marx so praised in

Capital—"When the worker co-operates in a planned way with others, he strips off the fetters of his individuality, and develops the capabilities of his species"—has now become diffused in the communication and epistemic technology inside and outside the factory or office.[25] So the training in co-operation—that had such revolutionary consequences in Marx's thought—has now become a commonplace experience for workers both inside and outside the waged workplace in the United States and Western Europe.

Howard Rheingold, a writer on the social implications of technological change, identified eight different "technologies of cooperation" that provide much of the training in co-operation that are now in use.[26] This article will not examine all eight of them, but simply note his discussion of "knowledge collectives," which "rather than treating knowledge as private intellectual property, they treat it as a common-pool resource, with mechanisms for mutual monitoring, quality assurance, and protection against vandalism and over-consumption."[27] These collectives need not be small. The most famous, Wikipedia—the *Encyclopédie* project of our times—is organized as a wiki (an easy to edit web page) that allows groups to create a large, self-correcting knowledge repository with millions of articles in hundreds of languages available for open access. But the key to such knowledge communities is the recognition of the exponentially growing power accruing to being a part of a huge coordinated group with enormous surplus capacity for computation as well as for investigation.

The making of the knowledge commons requires and potentiates the training in co-operation that is now inherent in the new technologies. But this development should not blind us—as a similar development blinded Marx—to the fact that the training in co-operation and communal values is not the unique product of mid-nineteenth century or early twenty-first century industrialization and mechanization.[28] This training and these values had been commonplace in human history down to early modern times and still are basic to the moral formation of most of the world's children to this day.[29]

Nor should this development dazzle us—as Michael Hardt and Antonio Negri seem to have been[30]—into thinking that this technology can only have one social outcome (increased co-operation) and will have a homogenizing effect on the work process throughout the planet, so that peasant farmers in India and shack-dwellers in South Africa will have an implicit alliance with computer programmers in Boston on the basis of the increasing immateriality and intellectuality of their work. True, industrial work became a paradigm of work in the nineteenth century; but that did not mean that *all* work was patterned on the factory system.[31]

Moreover, there is nothing inevitably unifying in a technology. Steam engines and computers can be both agents of division as well as agents of co-operation. Indeed, differences in the capital intensity of production processes are inevitably used to create hierarchies within the working class; both within enterprises and throughout the global system; with those working in the high-tech industries commanding a higher wage (and all that that means) than those working in the lower tech-industries.

However, there is no doubt that one of most surprising developments of the computer revolution is that alongside the "get-rich-quick" ethos of Silicon Valley, a fluorescence of communal behaviour has emerged among the cyber-commoners.[32] This will undoubtedly add a new dimension to the residual communality of the human race that has been preserved in thousands of agricultural villages throughout Africa, South America, and Asia and promises to be the mixed soil of the knowledge commons.

However, though the Silicon Valleys and the Nile Valleys of the world are important for the knowledge commons, there is no doubt that the universities are going to be the central institutions responsible for training in communal epistemic values that is essential to the making of a knowledge commons. Whether they will live up to this responsibility is an open question, for if their increasing commitment to neoliberal values intensifies, they will certainly not.

c. Changing the "Pay-offs": Struggle with State and Capital

Once the commons is foregrounded via the apocalyptic-prophetic message and the values of the commons are instilled in the coming generations, the makers of the knowledge commons must deal with the threats from the state to criminalize communal behaviour and from the market to tempt the commoners to defect from the community. These are continual threats and require a structural response if the knowledge commons is to be stabilized.

The state has a long history of criminalizing a wide variety of "customs in common." For example, workers used to sell the wooden chips produced in building wooden ships in eighteenth century England to supplement their income. This was their custom in common. Samuel Bentham, Jeremy's brother, redesigned shipbuilding yards to make surveillance of the workers more effective, and redesigned the law to criminalize the custom of appropriating and selling the chips. This surveillance and law reform dramatically lowered the pay-off of co-operating with other workers in picking up the chips and smuggling them out of the ship yard.[33]

The state's sequestering of knowledge and its support of copyrights and patents criminalizes the "free" dissemination and reproduction of knowledge. The antagonistic responses have been both on a legal level—the challenges in national and international courts of the intellectual property laws—as well as by direct action, i.e., the hacking of government web sites, the sharing of music and film DVDs, the placing of copyrighted material on public domain web sites, etc. However uncomfortable this bifurcated (half legal and half not) struggle makes us, its success will be crucial to the survival and growth of the knowledge commons in the coming years.

The second aspect of the shift in pay-offs requires a direct confrontation with the market and the rent-seeking character of intellectual property owners. An item of intellectual property is a sort of meta-commodity that one rents in order to produce another commodity or an object of consumption, just as land is a meta-commodity that one rents in order to produce other commodities, for example, wheat for sale, or subsistence goods, such as wheat for home consumption. The claim of the defenders of intellectual property rights is that without the possibility of receiving rent—in the form of leases, royalties, or licenses—there would be no incentive for people to produce new texts, software, and machines at some cost to themselves.

Certainly, this rental pay-off is a temptation for many to accept the restrictions on textual reproduction and dissemination in exchange. Who would not be tempted to accept the royalties for a best-selling novel (if one was the author) or the licensing fees of a successful Windows-like software program (if one were the designer) while accepting the restriction on copying? Thus the intellectual property regime offers the temptation to reject open access to portions of the knowledge commons.

Though the temptation is real and is often the source of the destruction of commons—is its empirical premise correct? Would innovation stop without intellectual property rent incentives? This claim's truth is hard to assess, but there are two major pieces of countervailing evidence. First, the human race has been innovating for tens of thousands of years before intellectual property legislation began to be introduced in the eighteenth century. Second, in the last few decades there has been an enormous amount of original work done on all levels of the internet—from designing the world wide web to writing an entry on an obscure fifteenth century Italian poet for Wikipedia—that has not been copyrighted or patented.

This evidence reminds us that there are many ways of rewarding people for innovations not based on rents and their excessive restrictions on reproduction. These alternatives range from wages and profits, to "priz-

es," "fame," and "gifts." Each of these forms of incentive has weaknesses and strengths, but there has been no argument or empirical evidence yet to demonstrate that the rental model is superior to them—indeed, the evidence mentioned above appears to call this model into question. Consequently, an important element in the making of the knowledge commons is the construction of alternative, non-market based forms of incentives for contributions to the knowledge commons.

Conclusion

At the end of this trajectory from lobster beds to university libraries it should be clear that the making of the knowledge commons is a huge task before us requiring a level of social imagination and collective will that surpasses the technical imagination and will that has created the digital computer and the internet. Shall universities play a productive role in this making or will they join with the corporate world in the project of enclosing and privatizing knowledge? This choice will determine not only the fate of the knowledge commons but also the future of universities in the twenty-first century. ∎

Notes

[1] For a discussion of the necessary and sufficient conditions for the existence of a commons see Elinor Ostrom, *Governing the Commons* (New York: Cambridge University Press, 1990), 88-102. My formulation of these conditions has also been deeply influenced by conversations with my commoner comrades: Massimo De Angelis, Iain Boal, Silvia Federici, and Peter Linebaugh.

[2] Vandana Shiva, *Staying Alive* (London: Zed Books, 1989).

[3] This term is often used by James Acheson in his *Capturing the Commons: Devising Institutions to Manage the Maine Lobster Industry* (Hanover: University Press of New England, 2003).

[4] Acheson, *Capturing the Commons*, 42.

[5] Colin Woodard, *The Lobster Coast: Rebels, Rusticators, and the Struggle for a Forgotten Frontier* (New York: Penguin Books, 2004), 191.

[6] Ibid., 266-273.

[7] Ibid., 191.

[8] Acheson, *Capturing the Commons*, 81.

[9] Ibid.

[10] Elinor Ostrom, "Collective Action and the Evolution of Social Norms," *Journal of*

[11] Woodard, *The Lobster Coast*, 269. For a discussion of "the shadow of the future," see Robert Axelrod, *The Evolution of Cooperation*, rev. ed. (New York: Basic Books, 2004), 12-13.

[12] For a discussion of commons value practices see Massimo De Angelis, *The Beginning of History: Value Struggles and Global Capital* (London: Pluto Press, 2007), 238-244.

[13] The notion of a "moral economy" has had many senses, I am employing here the one developed by E. P. Thompson in his essays "The Moral Economy of the English Crowd in the Eighteenth Century" and "The Moral Economy Revisited." Both essays are in E.P.Thompson, ed., *Customs in Common* (New York: The New Press, 1991).

[14] Acheson, *Capturing the Commons*, 97.

[15] Ferdinand de Saussure, *Course in General Linguistics* (New York: Columbia University Press, 2011), 13-14.

[16] Maria Mies and Veronika Bennholdt-Thomsen, "Defending, Reclaiming and Reinventing the Commons," special issue, *Canadian Journal of Development Studies* XXII (2001): 997-1023; Elinor Ostrom, *Governing the Commons* (New York: Cambridge University Press, 1990).

[17] Mies and Bennholdt-Thomsen, "Defending, Reclaiming and Reinventing the Commons," 1022.

[18] Respectively, George Caffentzis, "Professional Academic Ethics and the Structurally Adjusted African University," *Africa, Human Rights, and the Global System: The Political Economy of Human Rights in a Changing World*, ed. Eileen McCarthy-Arnolds, David R. Penna, and Debra Joy Cruz Sobrepena (Westport, CT: Greenwood Press, 1994), 173-191; Robert B. Laughlin, *The Crime of Reason and the Closing of the Scientific Mind* (New York: Basic Books, 2008); Michael Heller, "The Tragedy of the Anti-commons: Property in the Transition from Marx to Markets," *Harvard Law Review* III, no. 3 (1998): 622-688; David Bollier, "Growth of the Commons Paradigm," in *Understanding Knowledge as a Commons*, ed. Charlotte Hess and Elinor Ostrom (Cambridge, MA: The MIT Press, 2007), 27-40.

[19] Laughlin, *The Crime of Reason*, 5.

[20] David Bollier, *Silent Theft: The Private Plunder of Our Common Wealth* (New York: Routledge, 2002), 120.

[21] Nancy Kranich, "Countering Enclosure: Reclaiming the Knowledge Commons," in *Understanding Knowledge as a Commons*, ed. Charlotte Hess and Elinor Ostrom (Cambridge, MA: The MIT Press, 2007), 86.

[22] Ibid., 89.

[23] Ibid.

[24] Bollier, "Growth of the Commons Paradigm," 36.

[25] Karl Marx, *Capital*, Vol. I. (London: Penguin Books, 1976), 447.

[26] Howard Rheingold, "Technologies of Cooperation," in *The Art of Free Cooperation*, ed. Geert Lovink and Trebor Scholz (Brooklyn: Autonomedia, 2007), 29-65.

[27] Rheingold, "Technologies of Cooperation," 56.

[28] Marx, *Capital*, Vol. 1, 453.

[29] David Graeber, *Debt: The First 5,000 Years* (Brooklyn, NY: Melville House Publishing, 2011), 94-102.

[30] Michael Hardt and Antonio Negri, *Multitude: War and Democracy in the Age of Empire* (Cambridge, MA: Harvard University Press, 2004); Michael Hardt and Antonio Negri, *Commonwealth* (Cambridge, MA: Harvard University Press, 2009).

[31] George Caffentzis, "A Critique of 'Cognitive Capitalism'," in *Cognitive Capitalism, Education and Digital Labor*, ed. Michael A. Peters and Ergin Bulut (New York: Peter Lang, 2011), 94-102.

[32] Gigi Roggero, *The Production of Living Knowledge: The Crisis of the University and the Transformation of Labor in Europe and North America* (Philadelphia: Temple University Press, 2011).

[33] Peter Linebaugh, *The London Hanged: Crime and Civil Society in Eighteenth-Century England* (Cambridge: Cambridge University Press, 1992), 371-400.