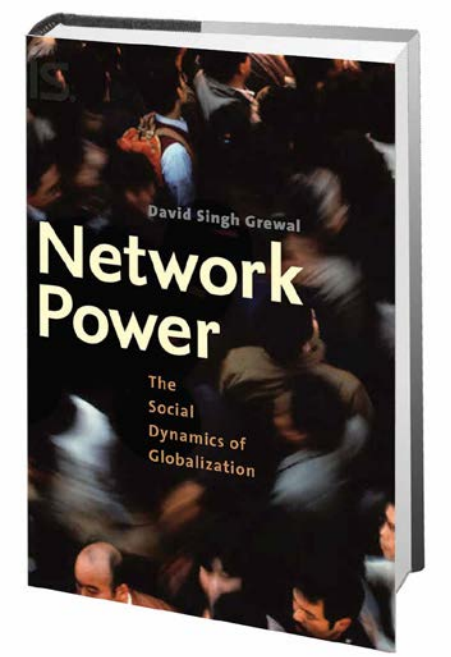

". . . **fresh and illuminating** . . . Network Power stands out. . . a **splendid synthesis** of economics, philosophy, and political science in the grand tradition of moral and political economy."

—Michael J. Sandel, author of *Democracy's Discontent*

". . . a **major, learned and wide-ranging contribution** to our understanding of the processes of globalization. . . . An **indispensable** work."

—Stanley Hoffmann, Harvard University

A NOTE FROM THE AUTHOR

The following chapter comes from my book, *Network Power: The Social Dynamics of Globalization*. There I analyze globalization by considering the way that power adheres in standards that unite networks of people around the world today. What I call the "network power" of a successful standard comes from the way it helps to coordinate networks of users, who are then able to engage in forms of beneficial cooperation (as we see in the exchange of ideas or goods). An example of a successful standard would be a language, for example, English. English has enormous network power, because so many people speak it; this makes it more valuable for non-native speakers to learn English than some other language. But the network power of English isn't the result of any intrinsic features of English (for example, "it's easy to learn"): it's purely a result of the number of other people and other networks you can use it to reach.

Many global standards share these features of "extrinsic," as opposed to "intrinsic" benefits to users, and the rise of new global standards allows cooperation among greater numbers of people than ever before. But it also threatens to edge out less dominant standards, and to stifle decentralized innovation.

Nowhere are these dynamics clearer than in the fight over standards in high technology. A successful standard can come to possess immense network power regardless of its intrinsic merits (or demerits), so long as it unites a large enough network of users. This can lead to particular problems in the realm of privately owned technological standards â€“ not only because the freedom of users to choose the best standards for their needs is curtailed when one standard rises to dominance, but because a great deal of power is handed over to the private owner of that standard in the process.

In this chapter, I try to spell out precisely what's at stake in this fight over the control of standards. Ultimately, I argue that adherents of the open-source movement will have to engage in a broader *political* fight over public control of technology if the free networked information economy is going to survive. —David Singh Grewal

CHAPTER SEVEN

Network Power in Technology

THE DYNAMICS OF NETWORK POWER outlined in the previous chapters are clearly evident in the domain of high technology, the globalization of which is a defining feature of our age. New technologies of communication and media have helped to establish a world of global commerce, culture, and consciousness. These technologies solve practical problems of coordination, facilitating interactions across great distances and building on the great eighteenth- and nineteenth-century advances that mark the modern age off from those preceding it. The Internet and the airplane, in our day, have furthered the compression of distance begun by the sailing ship, the railroad, and the telegraph.

Communications technologies in particular are based on underlying protocols or technical standards which can "spread" very quickly across borders to emerge as universal conventions. The relation between technology and standards is one that deserves scrutiny because competition over the control of technical standards is pervasive in the political economy of high technology. In this chapter, I discuss the network power of some of these standards, focusing on relatively familiar technical advances such as Internet browsers and operating systems, but also examining a few more obscure but nevertheless powerful ones, such as the ISO 9000, an international quality control standard. In all of these cases, what may look like an unproblematic process of technical coordination is shown

to involve an ongoing contestation over standards that take their value from their common usage, but which are not for the most part under common control.

INTERNATIONAL TECHNICAL STANDARDS

The creation and diffusion of standards underlying new technologies is a driving element of contemporary globalization. Business consortia, governmental bodies, and international organizations all promulgate their own technical standards, and consulting enterprises have sprung up to help businesses and consumers navigate their way through them. But international technical standards are not new: they have been around since at least the late nineteenth century in most major industries. Early industrial consortia often made great efforts to harmonize production, adopting common protocols to reduce the cost of adapting new designs, measurements, and quality levels when switching between suppliers in international chains of production. This process of standardization played an important part in what James Beninger has called the "control revolution," which followed from prior industrial advances and enabled the globalization of industrial production and mass consumption.[1]

Currently, international bodies responsible for promulgating technical standards exist in every area of industrial activity or commercial enterprise. We should not think of these standards as restricted to the high technology sector, although we may read about them most often in that context. For example, there is even a "Global Cement Information System" dedicated to disseminating international standards in cement production—a product critically important for all infrastructure projects, but far removed from the glitter of Silicon Valley.[2] Of course, standards do play an extremely important role in high technology, whether in telecommunications, media, or Internet applications.

The harmonization of potentially diverse standards is of critical significance for technological progress in these fields. It is also a critical element of business strategy: the fortunes of companies rise and fall with their control of technical standards. In their efforts to further such coordination, standards bodies—and even dominant companies—undertake standardization or harmonization (and often both). We should distinguish *standardization,* the creation of a new standard, from *harmonization,* the convergence on an existing standard by users of alternative ones. When

two networks using different standards come into competition, harmonization may offer a strategy for reducing the costs of exchange.

The harmonization of existing technical standards, and standardization in emerging fields, are essential for the spread of compatible technologies and products—in short, for "technological progress." These standards resemble measurement systems in that, without a common denominator, it becomes impossible to measure and compare products. However, they can be even more critical since products or processes operating according to divergent standards may prove incompatible, lacking the capacity for translation of the kind that we see in measurement ratios. (This problem is particularly acute when technologies are used to aid social coordination, for example in information and communication technologies as opposed to, say, the production of stainless steel, in which more easily "translatable" material processes prove central.) Technologies of coordination must often literally build a standard into the mechanics of the product, so that it becomes not just a means of external measurement and comparison, but an integral element of the product itself. Given the possibility of building machines or designing technical processes around any one of a number of technical standards, the need for compatible machinery and the harmonization of underlying standards has been clear from the beginning of the industrial age and is even clearer today, in the "New Economy" of networked high technology.

STANDARDS IN THE NEW ECONOMY

The new high tech economy depends upon the efforts of an immense number of international standards bodies. They include the Institute of Electrical and Electronics Engineers (IEEE), which has 800 active standards and another 700 under development, and is responsible for most cabling and networking standards in the United States, many of which subsequently spread abroad; the National Committee for Information Technology Standards (NCITS), which focuses on information processing standardization and has created important standards such as MPEG and JPEG formats for multimedia files, SCUSI-2 for interfacing computer components, and the C++ programming language; and the World Wide Web Consortium, a collection of international academic institutions (which offers what it calls "recommendations" rather than "standards") which created the HTML and XML mark-up languages. These standards,

even when not formed by an explicitly international body, quickly gain an international presence through harmonization driven by global commerce. That these standards rapidly develop a worldwide reach is unsurprising. When designing a law or national policy, it may be appropriate to think of a limited space and a particular context. By contrast, when devising a standard for multimedia applications, the widest possible use is not only desirable but will often prove necessary if the standard is to be attractive to its users, who will want to be able to reach as many potential co-users as possible. Perhaps like any form of cooperative activity, these standards tend to universality within their domain—which, in the case of high technology, can mean universality in networks with a literally worldwide expanse.

While international standardization is not new to contemporary high technology, it is nevertheless a relatively modern phenomenon, with mass industrial standards dating only from the late nineteenth and early twentieth centuries. In 1906, the first international body for the promulgation of technical standards was born, the International Electrotechnical Commission (IEC), which is today made up of 49 national committees and cooperates with other standards bodies and international organizations to coordinate international standardization in electrical and electronic engineering.[3] It publishes standards for electronics, so that manufacturers can make products that are compatible with other products throughout the international chain of manufacture and distribution. The American National Standards Institute, founded in 1918, is an umbrella organization for American standards development bodies, and often represents the United States in international standards negotiations. ANSI does not create standards, but advises on the development of new ones and attempts to help in the harmonization of existing standards. It publishes catalogs of standards, including over 8,000 different ones in its recent issue.[4]

In the United States, electronics standards are promulgated by the Electronics Industry Alliance (EIA), which began in 1924 as the Radio Manufacturers' Association.[5] The EIA is the main trade organization for the $381 billion U.S. electronics industry, covering all major sectors of electronics, including telecommunications. It has 200 staff members providing services, lobbying, and creating standards for the electronics and computer industry. Within the EIA, the Telecommunications Industry Association (TIA) is one of the most prominent standards bodies, with over

1,000 high tech companies as members and 70 current standards on offer covering all major telecommunications technologies.[6] (Founded in 1924 as a trade association dedicated to organizing exhibitions, it led an independent life until its recent incorporation under the umbrella organization, the EIA.) The TIA's international counterpart is the International Telecommunications Union (ITU), formerly the CCITT, which is dedicated to ensuring compatibility in international telecommunications through the promulgation of global telecom standards. It is "an international organization within the United Nations System where governments and the private sector coordinate global telecom networks and services."[7] Perhaps its most familiar standard is that governing Group III telefacsimile machines, which makes possible the international transmission of faxes.

All of these bodies exist in complicated public-private partnerships in areas in which setting the standard means creating the market (at least to some significant degree) through forms of public-private partnership and in regimes of ongoing "cooperative competition."[8] The creation of standards is not merely a way to provide a solution to a coordination problem; it may be equally an act of business strategy. Consider an example from automobile manufacturing, which might appear less susceptible to network power dynamics than the electronic technologies discussed above. In 1995 and 1996, the three largest car companies in America—DaimlerChrysler Corporation, Ford Motor Company, and General Motors Corporation—formed the Auto/Steel Partnership along with their suppliers to create standards in auto manufacturing. These standards, the NAAMS Global Standard Components, are now widespread in the industry.[9] The Auto/Steel Partnership aims to "describe and define the components that have been adopted as standard by those companies when designing and constructing stamping dies and body assembly tools for sheet steel body components." The standards for stamping were first published in 1995, while those for assembly came out in 1996, and were placed on the World Wide Web in order "to keep pace with the rapid rate of revision and expansion" and to make access to the "standards available to all users at no cost." Of course, the motivation behind the standardization of auto manufacture is clear: so long as the Auto/Steel Partnership has enough market share, the standards it promulgates will dominate in the industry, benefiting its member firms.

MICROSOFT: THE NETWORK POWER OF TECHNOLOGY?

International standardization is a widespread and long-standing phenomenon; only recently, however, have the full implications of the possible *monopoly* power produced by standardization become of general concern. The case that brought this feature of standardization to public attention is *United States vs. Microsoft,* in which the Microsoft Corporation was accused of anticompetitive practices stemming from its near-total dominance of the operating systems (OS) market. (The concern about Microsoft's control of the OS market had been pervasive in the high tech world long before it came to public attention.)

Microsoft's flagship product, the Windows OS, controls approximately 90 percent of the market in operating systems—with some variation depending on the year. An operating system is the platform on which other software applications run, the basic interface between the user of a computer and its machine code. There are clear network power reasons for this dominance: operating systems exhibit a variety of network effects that will work to cement the position of a leading standard once a sufficient number of other users have accepted it. However, it is not Microsoft's control of the OS market that spawned the anti-trust litigation, but the way in which the corporation allegedly made use of its market dominance.

Since almost everyone uses the Windows OS, Microsoft can promote an array of other applications simply by *bundling* them with Windows—so that dominance in this key area can translate into dominance in many other areas. For example, by bundling its web browser, Internet Explorer, with the Windows OS, Microsoft was able to take the market over from its rival (and the former industry leader) Netscape. Whether or not this practice constituted a legally actionable anti-trust violation, it is clear that it succeeded as a matter of business strategy by exploiting the network power of one product to push others. As Robert Reich explains, "Windows is used so widely that other producers of computers, browsers, and other software have to license it from Microsoft if they want to connect their gadgets and codes to most other gadgets and codes in the market. This gives Microsoft power to thwart competition and discourage innovation."[10]

The federal investigation into and prosecution of Microsoft lasted over a decade, during which time the case—and the dynamics of innovation and control in computing more generally—gradually came into public focus. In 1991, the Federal Trade Commission set up an investigation into

Microsoft's practice of "tie-in" sales, in which it linked its applications, such as its Internet browser, to Windows. The FTC investigation reached an impasse and was closed in 1993. Later that same year, the Department of Justice began its own investigation, which eventually led to a federal government lawsuit against Microsoft beginning in 1998. In the five years between 1993 and 1998, Microsoft first consented to, and then violated, an agreement not to use tie-in sales to promote its products. When it launched its web browser, Internet Explorer, it bundled it with Windows, arguing that the browser was not a separate product but an inbuilt and inextricable feature of the Windows OS itself. This move enabled it to quickly overtake its main competitor, Netscape Navigator, but it also led to the federal lawsuit against it.

The lawsuit was led by the Clinton-appointed U.S. Attorney General Janet Reno and joined by 20 U.S. states. It charged Microsoft with anti-competitive practices such as locking out the applications of competitors by leveraging its market dominance in the operating system market. The original trial lasted 23 months and ended with a verdict by Judge Thomas Penfield Jackson against Microsoft, which was to be broken into two separate companies, one that would make the Windows OS and the other that would make applications to run on it. Though this original court case would later be reversed and remanded, it did reveal how Microsoft used its operating system monopoly to undermine competitors' applications. It became very clear that Microsoft's monopoly was based on more than network effects alone, but included more predatory and anti-competitive tactics.

Microsoft denounced the decision and appealed. On appeal, the district court decision to divide Microsoft was overturned because of errors (such as speaking to the press) alleged to have been committed by Judge Jackson. The case was sent to a new judge, Colleen Kollar-Kotelly, who was chosen at random by a computer. Less than two weeks later, in September 2001, the Department of Justice—now under the administration of President Bush, to whose election campaign in 2000 Microsoft had donated generously[11]—reversed course and dropped the effort to have Microsoft split in two. Two months later, the Bush administration announced a new settlement with Microsoft in what most analysts and commentators took to be a strong (that is to say, cheap) victory for the company. (Microsoft stock price jumped 7 percent in after-hours trading following the

announcement that Judge Kollar-Kotelly had approved the settlement.) Kollar-Kotelly announced sanguinely: "Promises have been made that the company will change its predatory practices, which have been part of its competitive strategy."[12]

The settlement demanded very little of a company that had been facing a radical restructuring just two years earlier. Microsoft was not broken up, or obliged to open its code to competitors; it simply had to release some technical data to allow other software companies to write programs for Windows, and it promised to refrain from retaliating against computer manufacturers that use rival products. For Microsoft's rivals, these promises amounted to very little, and several parties continued to press private lawsuits against the corporation. Nine of the suing states and the city of Washington, D.C., refused to settle on terms so favorable to Microsoft, and continued their own separate cases against the company. In 2004, the original settlement was finally approved on appeal, and the case *U.S. v. Microsoft* came to a close.

Microsoft's legal woes, however, were far from over. It settled the nine state cases against it for damages totaling $1.5 billion, including a $1.1 billion settlement with the State of California. (According to some observers, Microsoft has managed to turn many of these state settlements to its advantage by donating computers—and its software—to schools, in lieu of cash payouts and with the probable expectation that it will thereby gain future customers.) The civil lawsuits brought by its competitors also cost Microsoft dearly, since they went forward with the benefit of the original trial court's findings of fact, which revealed the company's anti-competitive behavior. In 2003, it paid out $750 million to AOL-Time Warner (which had bought Netscape) to settle an anti-trust suit. In 2004, it settled patent disputes with Sun Microsystems for $1.6 billion and with InterTrust for $440 million. In 2005, it paid Real Networks $761 million and settled IBM's claims of discriminatory pricing and overcharging for another $775 million (and that does not even exhaust IBM's pending litigation against Microsoft).

Most significantly, in March 2004, the European Commission, which had begun an anti-trust investigation of Microsoft in the 1990s, fined the company €497 million, approximately $600 million in 2004 dollars, the largest single anti-trust fine against a company that the EU had ever lodged up to that point. Importantly, the Commission forced Microsoft to make

a version of Windows without its media player bundled with it, and has demanded an end to bundling and more transparency in the Windows OS code.[13] Microsoft has now twice appealed the ruling, and it is unlikely that the matter will be settled for another few years—but the contrast with the Bush administration's approach to the company is striking.

NETWORK POWER AND ANTI-TRUST

However the European Commission case is finally resolved, it is clear that Microsoft's dominance will continue in several areas, particularly in the operating systems market (and also that of word processing software, since Microsoft Word controls 95 percent of that market). Given this dominance, it seems unlikely that Microsoft will abstain from further bundling practices; even the large cash pay-outs to competitors that it was forced to make following civil suits brought against it have not dented the company's generous $50 billion cash reserves. The more critical issue is what public control, if any, governments may try to exert over the network power of the technical standards at the heart of Microsoft's lucrative monopoly position.

Microsoft contends that the dynamics of the high tech industry alone spurred its rise to dominance, given the supply-side economies of scale in digital production—a point which it claims Judge Jackson failed to understand. While its opponents have argued that Microsoft's anti-competitive practices are as ruthless as that of any monopolist, it is also true that network power alone would have had the capacity to establish convergence on shared operating systems and word processing programs. Significantly, therefore, the implications of the Microsoft case go beyond the OS market and even the high technology sector, and illustrate broader problem posed by network power in modern economic and industrial life. Indeed, the reason that I introduced above the many other areas in which industrial standardization occurs was to situate the Microsoft trial within the context not just of high technology networks, but of the imperatives of industrial standardization more generally. For Microsoft's dominance provides a dramatic example of the monopolistic tendencies of network power in areas where technological standardization is a necessary industrial practice—that is, in most (if not all) of modern industry. Indeed, the network power of technical standards is a general feature of industrial production. Many other industrial standards could also quite feasibly support

monopolies if ever they happened to fall under the control of a single corporation. Significantly, this fact alone would not necessarily put them in violation of U.S. anti-trust laws, since these monopolies could plausibly come about as unprejudiced market outcomes, rather than be sustained by any explicitly anti-competitive practices.

In a network power framework, this fact is easy to understand: where a technology embodies a successful standard, economies of scale will drive the adoption of that standard by increasing numbers of users, leading to the establishment of a single, universal standard of coordination, all else being equal. This solution is efficient at one level, but, as with any successful standard, it threatens to undermine innovation and local flexibility. It also threatens to give too much control to a single private actor, if the standard is privately owned or controlled. An interesting literature on "flexible production" has studied this problem of achieving economies of scale within regimes of relatively decentralized ownership and production in which innovation and autonomy are less at risk.[14]

In extreme cases, network power will propel successful standards to positions of complete monopoly (in the domain of high technology as well as elsewhere), giving a single private actor enormous power over the relations of sociability where those relations are based on a proprietary (that is, privately owned) standard. In the specific case of Microsoft, it seems that these relations of sociability swamped the countervailing power of sovereignty through the functional equivalent of a "pay-off" to the Bush administration, however legal its campaign contributions may have been under U.S. electoral law. In an economic system committed to competitive markets—and, wherever necessary, sustained by government intervention to support competitive conditions—perhaps the only real solution to this problem is to address the network power of technology not at the level of business regulation, but at the level of intellectual property. The problem may not be that one standard will overtake others given our desire to cooperate in as large a network as possible, but rather that any private company (or, more generally, any single actor) should own or control that standard itself.

In fact, Microsoft faces its greatest challenge from a social movement that contests the idea of private ownership of information standards altogether: the free software movement, sometimes called—though I will distinguish the two below—the "open-source" movement. Individuals,

companies, and even countries looking to escape dependence on Microsoft's products have been turning to open-source or free software programs in large numbers. Of particular interest to a range of companies and even countries—including China, Brazil, India, and many in the EU—is the free software operating system *Linux,* which poses a possible long-term challenge to the dominance of Windows.

FREE SOFTWARE

The phenomenon of shared, collaborative production in software and other industries has become increasingly visible in recent years, with a wide variety of legal, sociological, and economic works examining some aspect of this new movement. In many of these discussions, the term "open source" is used interchangeably with that of "free software." Understanding the difference between the two and the politics of standardization in software production requires a brief historical excursus into the development of modern computing and the new networks of production and distribution that it enables.[15]

The story begins with the creation of the "Unix" operating system, which was developed in the early 1970s by scientists working at Bell Labs, the research arm of the then-monopoly AT&T. As Eben Moglen, a law professor and founder of the Software Freedom Law Center, explains, "The idea of Unix was to create a single, scalable operating system to exist on all the computers, from small to large, that the telephone monopoly made for itself."[16] Unix was written in a computer language called "C" which was also a creation of Bell Labs. As the C language "became common, even dominant, for many kinds of programming tasks," by the late 1970s, "the Unix operating system written in that language had been transferred (or "ported," in professional jargon) to computers made by many manufacturers and of many designs."

Initially, AT&T distributed Unix widely, in both academic and industry circles. But it maintained commercial control of the Unix standard and required licensees to pay fees, which were too high for individual computer users to afford. In the course of the 1980s, during the revolution in personal computing, Unix or Unix-like systems became the center of commercial battles in which various companies and industrial consortia backed a particular proprietary version of the operating system. Indeed, although the proprietary operating systems of Microsoft run on a different

platform from Unix (called DOS or MS-DOS), Microsoft even marketed an early Unix-like system known as Xenix.

Outside this commercial competition, a researcher at MIT named Richard Stallman—or "RMS" as he is known—developed a version of a Unix-like operating system that he called GNU (a recursive acronym for "GNU's Not Unix"), which he distributed for free. The method of his free distribution is the crucial part of this story, for unlike the earlier developers of Unix (or other operating systems), RMS did not simply distribute the code to any who wanted to use it, for whatever purpose (including the development of proprietary software). Rather, he distributed it under a new form of copyright license that he invented, the GNU General Public License (GPL). Any program that uses free software obtained under the GPL must in turn license itself under the GPL, making its source code available for any computer programmer to adopt, adapt, borrow, give away, or sell, so long as she does not exclude others from doing the same. As Moglen explains, this meant that "anyone could freely modify and redistribute such software, or sell it, subject only to the restriction that he not try to reduce the rights of others to whom he passed it along." The underlying idea is that no person or group of people should be able to control source code, and that everyone should have the ability to see code, work with it, and transform it. The GPL thus uses copyright law to *undo* the usual limitations and proprietary emphasis for which authors turn to copyright—which is why movement adherents have dubbed it "Copyleft." Copyleft stems from a commitment to intellectual freedom and egalitarian or non-dominating social relations of production and sharing—or what RMS called in his famous *GNU Manifesto,* "friendship" among programmers.[17] The third version of the GPL—"GPL v. 3"—is now being drafted online in a participatory manner, to guard against more recent threats to free software.

The initial gift of code that RMS provided under the GPL has since been incorporated into many later innovations, which have been released for others to use and adapt. The most significant of these later contributions to free software was the development of the "Linux" operating kernel for use on personal computers by Linus Torvalds, who released it under the GPL in 1991. The subsequent GNU/Linux development has been a major focus of collaborative development in the free software movement (although other free software programs have also been successful). Moglen explains:

> Because Torvalds chose to release the Linux kernel under the Free Software Foundation's General Public License . . . the hundreds and eventually thousands of programmers around the world who chose to contribute their effort towards the further development of the kernel could be sure that their efforts would result in permanently free software that no one could turn into a proprietary product. Everyone knew that everyone else would be able to test, improve, and redistribute their improvements. Torvalds accepted contributions freely, and with a genially effective style maintained overall direction without dampening enthusiasm. The development of the Linux kernel proved that the Internet made it possible to aggregate collections of programmers far larger than any commercial manufacturer could afford, joined almost non-hierarchically in a development project ultimately involving more than one million lines of computer code—a scale of collaboration among geographically dispersed unpaid volunteers previously unimaginable in human history.

Due to the ongoing development of the Linux operating system, Torvalds's original contribution now represents only a fraction of the kernel, which has grown substantially as a result of the contributions of others.

This model of free software development is now often called open-source production. However, the term "open source" was deliberately adopted in 1998 by programmers building off the success of GNU/Linux who wanted to avoid what they felt were the undesirable political connotations of the word "free" in "free software," and who had a variety of personal and ideological disputes with RMS and his Free Software Foundation. The idea of "open source" has since then attracted increasing press coverage and commercial attention. As the Open Source Initiative (OSI) admits, "This terminological debate is understood by all parties to be a proxy for wider issues about the community's relationship to the business world."[18] The term "open source" as a depoliticized alternative to "free software" has also been promoted by Eric Raymond, a libertarian computer programmer, celebrity hacker, and self-described "anarcho-capitalist," who has expressed a variety of controversial public positions supporting unrestricted access to firearms and an intensification of American military campaigns overseas.[19]

"Open-source" software may sound as though it is simply "free software" rebranded for marketing purposes, built on the base that RMS established with the GPL—but in reality the two forms of software may differ considerably, depending on which particular "open software license" is used, and there are now dozens of licenses that the OSI has certified. The divergences between "open-source" software and free software may continue to grow as the third version of the GPL is produced (under the direction of the Software Freedom Law Center and the Free Software Foundation) to reverse recent developments in "digital rights management" and state-level software patents, both of which threaten to erode the full control that users have over programs licensed under the second version of the GPL.[20] However, this revision poses a threat (so it is argued) to companies using "open-source" software—for example, working off the GNU/Linux kernel—but which do not want to be forced to open all their code as would be required under the GPL v. 3. Whether these companies are trying to privatize a common resource in a way that contravenes the spirit of "free software" is a point of controversy among programmers.

The importance of free software can be understood in terms of its network properties. A proprietary standard like Microsoft's Windows operating system can come to occupy a monopolistic position, like any universal standard, exhibiting what Max Weber called "dominancy by virtue of a structure of interests," or what I have described here as "network power." A proprietary standard of that kind is *available,* in that it is open for new users to adopt (usually contingent on payment of some kind), but it is not necessarily either *compatible* or *malleable*. Indeed, the incompatibility of Microsoft standards with other programs has proved a serious source of friction for the company, provoking ongoing litigation against it. But this combination of network properties—availability, incompatibility, and non-malleability—is a "winning" combination for a universal standard, as I described in Chapter 6.

By contrast, free software is available, compatible, and malleable. Its difference from proprietary standards lies not in the code itself, but in the forms of intellectual property underlying it. As Eben Moglen explains, "This use of intellectual property rules to create a commons in cyberspace is the central institutional structure enabling the anarchist triumph." The triumph lies not only in the superior productivity that comes from mobilizing large numbers of people to collaborate in a non-hierarchical manner

on a common endeavor—as we see in the case of GNU/Linux—but in the creativity and personal freedom that has flourished thereby. This triumph, it should also be said, subsists despite not being reflected in market share (at least in the operating system market), since most consumers do not use free software or open-source programs. Why they do not is, in part, because of a problem we have seen before: the lock-in to a dominant standard that provides social coordination.

GLOBAL QUALITY MANAGEMENT: THE ISO 9000

To illustrate these dynamics using a less familiar (and less controversial) example, consider the rise to global prominence of the ISO 9000, a set of codified principles for quality control in production that is still largely unknown outside the organizations that use it. The ISO 9000 is neither high tech nor politically contentious, and so it is well suited to being analyzed for our purposes. It is a standard that provides a solution to a global coordination problem: how quality control should be assessed up and down the chains of global production and commerce. It specifies a set of principles for quality control assessments promulgated by the primary international standards body, the International Organization for Standardization (ISO). The various standards promulgated by this body are numbered and use the title, "ISO," a name whose origin is a matter of some speculation, with some assuming that it is an acronym for International Standards Organization and others arguing that it is a word derived from the Greek "isos," which means equal. (In this latter formulation, ISO is used because it is through ISO standardization that companies are rendered "equal.") The ISO creates standards for almost every area of technical and industrial work, with the exception of electronics, which remains within the purview of the International Electrotechnical Commission (IEC). Most ISO standards suggest ideals and targets in technical and other fields: they are, for the most part, product standards.

The ISO 9000, by contrast, is essentially a management standard, a process-oriented scheme for disclosure of assessment rather than one for product quality. It is by far the most widely known management standard, with the ISO having certified almost 900,000 organizations in 161 different countries as conforming to it at the time of this writing.[21] According to some scholars, the ISO 9000 seems to be losing some of its luster in the advanced industrial world as problems with the standard emerge.

Nevertheless, particularly in developing world economies without reputations for consistent product quality, ISO 9000 certification provides entry into global markets linking disparate and distant contributors in a chain of production, without which smaller suppliers without an international reputation might be left out. Notably, its impact is even felt outside the world of private business, as some law courts and government bodies have also begun seeking ISO 9000 certification.[22] How effective this set of quality control standards will prove in certifying bureaucratic rather than commercial operations remains to be seen.

The ISO 9000 is a standard in the second sense that I discussed in Chapter 1, a *membership standard*. It does not inherently govern any social relations—as English does in structuring speech, for example, or as code governs computing—but provides a target for compliant companies and organizations, useful as a signal to others. It specifies what aspects a business must review, how to conduct internal audits, and procedures for disclosing which quality control assessments were made. Consisting of five distinct but related standards, the ISO 9000 ensures formalization of documentation so that a company can see what kinds of assessments a supplier has performed, and will understand the results of those assessments. Certification by private, and usually commercial, third-party auditors is the common way that a company demonstrates conformity with the standard. Importantly, while the standard provides a way to document quality assessment, it does not specify any particular quality control systems for adoption. What it offers is a standard by which a company can make sense of the quality assessment procedures that were performed by the company from which it receives supplies.

This may seem a step removed from what is of most interest to consumers—the level of product quality—but what it enables is something more basic: a way of talking about what kinds of quality assessments have been done without yet specifying a particular target level. A client company that demands ISO 9000 certification from its suppliers can rely upon a single comprehensive and comprehensible standard rather than needing to navigate the divergent standards of many different possible suppliers or to enforce its own assessment procedures on them. Thus, the ISO 9000 encourages conformity not at the level of actual production—or even in the assessment of that production—but in the way that such assessments are disclosed and communicated. It represents the standardization of the

international language of business management, offering a system that makes internal audits accessible to outsiders, providing needed clarity as a business attempts to understand what a supplier wants to communicate about its production process. Seen in this light, as a mechanism for enhancing communication and disclosure, its widespread use becomes more understandable. It is a form of recognition and signaling in the complex global marketplace. Indeed, while the benefits of ISO 9000 certification remain hotly contested, one recent study has concluded that certification is a benefit to compliant firms, not because of any operational changes it brings about but because certification reduces "informational asymmetries" in the market.[23]

THE NETWORK POWER OF THE ISO 9000

As with any global network, the ISO 9000 has a history that explains its current dominance.[24] It emerged out of earlier standards—a number of them, in fact. Its immediate predecessor was the British Standard BS 5750, published by the British Standards Institute in 1979 for use in the military and public utility sectors. In 1987, the BS 5750 had its scope expanded to include service-providers, and in 1988, the International Standards Organization adopted it without any revisions and renamed it the ISO 9000.

Interestingly, the British Standard BS 5750 was itself the earlier product of Cold War–era military integration: the British Standards Institute adapted British military quality control standards for use in civilian manufacture. These military standards came from earlier NATO versions, but the original standard was the U.S. Department of Defense standard for quality control (MIL STD 9858A), which was developed during and following World War II, and on which the later NATO standard was based.

Thus, the ISO 9000 standards derive from military methods for the control and monitoring of suppliers, which is no surprise given that warfare in an industrialized and global world necessarily unites many local suppliers in a worldwide network. But the ISO 9000 is even more deeply linked to government patronage. It gained considerable prominence when the European Commission began promoting it as a way of integrating management practices across the diverse member states of the European Common Market. In fact, owing to this early European support, more European manufacturers are ISO 9000–compliant than American firms. However, American firms are increasingly becoming certified, largely in response to

client demand—whether from European subsidiaries in the United States or U.S. government agencies. (Ironically, some American businessmen see the ISO 9000 certification as a costly process necessary to satisfy European customers—as an onerous European "import"—unaware that it was first designed by the United States military and exported to Europe in the context of World War II and the Cold War, from where it is only now being re-imported as a civilian standard.) Many European and American regulatory agencies require ISO 9000 certification—or that of ISO 9001, a similar standard for medical suppliers—as part of regulatory compliance. Further, U.S. and European military purchasers, both within NATO and in national militaries, require ISO 9000 certification from suppliers. U.S. and EU non-military government purchasers are also increasingly coming to insist on certification, where it is not already required.

With important government agencies and their suppliers requiring ISO 9000 certification, private parties face increasing pressure to become compliant as a way of accessing this significant market share. The network of industries using the earlier BS 5750 series of the British Standards Institute grew because military suppliers and government agencies required it, thus providing a large and relatively stable market. The standard thus surpassed the threshold of visibility owing to the support of government patrons willing to develop and promulgate it, which in turn led to its adoption by the International Standards Organization.

While we might suppose that *intrinsic* reasons drove its initial creation and adoption by the military, the proliferation of ISO 9000–compliant businesses and other organizations would seem to suggest that *extrinsic* reasons have recently been playing a more significant role. (Indeed, the growth of the ISO 9000 appears to be client-driven: according to numerous management studies, certification has become an aspect of contract negotiations and is adopted mainly in response to customer demand.) The prominence of the ISO 9000 is owed in large part to its support from the state. The standards underlying the ISO 9000 gained prominence because of their establishment by and link to state actors, after which other government agencies linked back to it, piggybacking on the standard in the construction or revision of regulatory schemes. Once it gained followers in the world of private business by virtue of this co-evolution with the state, the ISO 9000 began to spread by what we might consider *the merger of force and reason,* similar to the recent trajectory of the network power of

the English language. The ISO 9000 is now a standard that many businesses feel they "must" adopt, or else face losing customers.

Thus, in any given market sector in which this demand becomes sufficiently widespread, reason and force merge, and the ISO 9000 passes the threshold of inevitability. To be active in that sector, then, ISO 9000 certification becomes a requirement, as it is now in aeronautics, auto manufacture, and defense contracting, for example. Clearly, the ISO 9000 functions as a market signal in the global coordination of production, as is evidenced by the fact that executives complain it does not help their businesses run more efficiently but is nevertheless required by customers. In fact, they indicate the opposite: that certification is costly and time-consuming, and often a barrier to achieving product quality that cannot be documented according to ISO 9000 rules.[25] Nevertheless, they rationally choose to certify as ISO 9000–compliant given the demands of commercial coordination.

PUBLIC CONTROL OF TECHNICAL STANDARDS

I introduced the ISO 9000 to make four related points about the control and promulgation of technical standards in globalization, which pertain to the fight over operating systems too. First, given its widespread and increasing use worldwide, manufacturers with a broad base of clients overseas feel under increasing pressure to become ISO 9000–compliant, even where the clientele demanding certification does not yet exist. Expecting that potential clients either want or will want certification, many firms are adopting the ISO 9000 as preemptive strategy to gain access a larger number of potential clients. Managers choose to become certified because it provides a signal to possible customers, even though they often feel simultaneously that the certification is a waste of resources and accomplishes little internally.

Second, the role of the state in the early life of a standard—in its design and initial propagation—may be critical to its emergence and internationalization, even though these standards may be essentially private rather than public, spreading through voluntary choice rather than legislation or regulation. In fact, a standard may gain prominence by its early link to the state (in one form or another), but once established also provide a convenient benchmark that unrelated state agencies (and other governments) may use as a reference point in turn.

Third, as the ISO 9000 becomes seen as the international industry standard, its content is increasingly the site of political contestation. Environmental and labor groups want to link various corporate-responsibility standards to ISO 9000 certification, so that the core function of market signaling which the standard provides would be tied to these other objectives, for example, fair labor practices as articulated by the International Labor Organization (ILO). It is interesting to note that the demand for linkage here is to a private standard exhibiting network power, not to a multilateral treaty organization like the World Trade Organization, which depends on government participation.

Finally, within companies, too, the standard has a political edge—one of the main benefits that executives report having come from ISO 9000 certification is the establishment of new routines of worker supervision, self-monitoring, and continual internal auditing which employees would otherwise resist. If these changes are represented as integral to ISO 9000 certification, which is perceived as a common and non-negotiable need for company survival, they are accepted more easily. The standard may thus serve as an alibi for a set of other purposes, which are themselves frequently left obscure or unstated.[26]

Currently, the ISO 9000 functions like an open-source quality control standard, owned by no one but usable by any number of parties, public or private. Now imagine instead that a single, multibillion-dollar corporation owned (or otherwise took control of) the ISO 9000. Suppose that in 1988, instead of the International Standardization Organization adopting it, the BS 5750 was bought by an American multinational that licensed it for a fee to users. Assume further that the same process currently driving the globalization of the ISO 9000 would lead companies to use the privately owned ISO 9000, pushing it to a monopoly position. (Of course, the corporation might help this along with anti-competitive practices that undermined competing quality control standards in their initial stages and by buying out and assimilating more advanced competitors.) Given the four points just discussed about the ISO 9000—its history of public use and links to state support, the politics of its adoption internally and externally, and its emerging universality—we might feel very uncomfortable with a single business controlling the widely used standard as if it were just any form of private property. (We are leaving aside specific anti-trust legal violations or the economic effects of monopoly ownership that we might

also consider.) For the truth is that the ISO 9000 is not a form of private property in the same way that someone's backyard may be. Its value comes entirely from its common, social use as a coordinating mechanism, as a signaling device. The form of private property here resembles not the ownership of a car, but the private control of a language—not a rival good but a conventional one or an "anti-rival" good, in that the more people who use it, the more valuable it is for others to use in turn. In the case of a privately owned ISO 9000, one strategy the government might employ to neutralize some of the anti-competitive effects would be to refuse to privilege any single owner with final control over the standard—which might be especially important given that the "good" in question takes its value from (and in turn mediates) social relations. However, to keep the standard open would require a different kind of legal regime than one resembling private possession; it would require, in effect, de-privatizing the standard.

To return (with the example of the ISO 9000 in mind) to the Microsoft case and the battle over operating system standards, an analogous remedy—and one that was considered originally along with the breakup of the company—would require Microsoft to open its code to competitors so that all of its rivals could claim equal property in it. While this remedy was not imposed in the end, the question of intellectual property proves unavoidable, since New Economy monopolies rely on such property rights over standards. Even the rather modest requirement that Microsoft separate its web browser from its desktop still broaches the status of intellectual property—that is, the extent of Microsoft's copyright over Windows and whether it can use that right to require computer manufacturers to bundle Microsoft's other applications with it.

The extent to which we should grant and protect private control of widely used standards is a question that will continue to plague us in an age of network power, regardless of how any particular court case proceeds.[27] Whether a standard in common use is more like a language or more like someone's backyard is analytically clear: it is obviously more like a language than a discrete object or piece of land. Furthermore, it is more like a language than even a particular expression in language, such as someone's novel. But this analytic distinction does not settle the matter: we could still permit private control of common standards if it were beneficial. Deciding whether it is beneficial or not requires entering

into a much broader series of debates about politics and production than we have so far allowed ourselves. Part of the problem, of course, is that powerful private interests often have a great deal at stake in our deciding that widely used standards—like Microsoft's Windows—should be granted the same kind of legal status that we accord to someone's backyard, even if (unlike someone's backyard) they are indispensable to our productive and creative relations with one another.

The nineteenth-century complaint that private ownership represents a form of theft will surely be substantiated ever more dramatically in the twenty-first century, whether or not we choose to make that charge explicitly. For consider the point: the value that a particular standard has is only partly a function of its intrinsic properties; more often, I have argued, it is the *community of users* that makes a standard valuable, for extrinsic reasons. In other words, *we* through our social coordination provide the value which successful private actors—first-movers in the relations of sociability—then skillfully cash in on. It could be otherwise, if we decided to use the power of sovereignty to reshape the private relations of sociability. For example, we could have voted to have Microsoft Windows (or an alternative) serve as a universal standard or to regulate access to it in a manner that would encourage a diverse range of compatible alternatives. Instead, we waited to see what the aggregation of our individual, decentralized, and interdependent choices would deliver to us—and now we protect the result as "private property."

It may be true that the benefits of scale make sharing a single standard desirable in many instances. In these cases, if we can build properties of malleability into that single shared standard, we will be able to alter and revise it more easily later—an attractive feature of free software that is not available with closed proprietary standards. If we can build properties of compatibility into it, the pressure to abandon less dominant standards will decrease, preserving a richer variety of alternatives. But even where these ameliorations are not possible and we must adopt a universal standard, we are not required to give possession of it over to any private agent—and there may be many good reasons, including those concerning creativity, workplace autonomy, and system-level efficiency, for refusing to do so. In the case of Microsoft Windows, however, the universalization of one particular operating standard came about via the private relations of sociability rather than through public deliberation and collective choice.

TECHNOLOGICAL UTOPIANISM

One reason that we do not arrive at shared standards through public deliberation and collective choice is that many opponents of proprietary standards remain ambivalent (or outrightly hostile) toward the public agency that such collective choice-making involves. Indeed, how best to counter the power that private actors have over technical standards remains the subject of a debate that reveals the "technological utopianism" of the open-source movement. Many movement adherents partake of a libertarian or anarchistic temperament, expressing a skepticism or hostility to organized politics, deriding the "state" or the "government." But it is one thing to claim that a particular government is corrupt or inefficacious —witness the U.S. decision to settle with Microsoft—and quite another to miss the ways in which the relations of sovereignty can be used to tackle problems which emerge as a result of the untrammeled dominance of the relations of sociability. Indeed, the skepticism that many open-source adherents express in relation to public agency borders on a more general failure to appreciate the essential role of politics in fashioning and maintaining emancipated and egalitarian social relations in digital production.

Technological utopians are right to praise the new forms of "peer production" and the new electronic "share economy" that have emerged in the networked information economy, and which are prominently associated with open-source collaboration. The fantastic or "utopian" element that I want to identify is emphatically *not* the idea that there can be non-dominated, relatively egalitarian, or emancipated forms of productive activity, but rather that these relations of sociability can survive without the mobilization of a broader democratic politics of sovereignty on their behalf. My contention is that, like the right-wing anarchism of "libertarianism," today's left-wing anarcho-syndicalist movements—including the new forms of "technological utopianism"—fail to recognize adequately that only the organized power of sovereignty can counter powerful private agents.[28]

As an example of this kind of argument, I could choose any number of anti-government screeds posted online but will take as my starting point a sophisticated contribution, *The Wealth of Networks,* recently published by law professor Yochai Benkler. I want to state at the outset that Benkler's analysis of these issues is elegant and insightful, and that what I want to scrutinize critically is not his commitment to a free networked

information economy, but the strategies that he supposes will be effective in defending it. Benkler examines in great detail the success of collaborative, networked production, offering an analysis of the subject that exhibits the combination of skepticism toward organized politics and concomitant hope for non-dominated, voluntaristic relations of sociability that characterizes technological utopianism. Benkler signals this skepticism about sovereignty and his support for voluntarism at the beginning of his book, writing that his "approach heavily emphasizes individual action in nonmarket relations," and adding that "the state plays no role, or is perceived as playing a primarily negative role" in most of his argument. His admits that his argument, therefore, "seems more of a libertarian or anarchistic thesis than a liberal one," and suggests that this is because "what is special about our moment is the rising efficacy of individuals and loose, nonmarket affiliations as agents of political economy."[29] He then narrows his position further, arguing that his thesis is less a "libertarian" one—since he wants to deny or curtail claims to intellectual property—than it is "anarchist, focused on the role of mutual aid and highly skeptical of the state."[30] Indeed, Benkler's assessment of state action is nowhere positive: "the state in both the United States and Europe has played a role in supporting the market-based industrial incumbents of the twentieth-century information production system at the expense of the individuals who make up the emerging networked information economy." He is quick to qualify that this hostility comes less from a commitment to an anti-statist philosophy than from his conclusion that "there is more freedom to be found through opening up institutional spaces for voluntary individual and cooperative action than there is in intentional public action through the state."[31]

Against the alliance of the state and powerful market actors, Benkler argues in favor of non-dominated relations of sociability. He believes that it is in new technological networks—signal instances of the constructive force of voluntarism—that real freedom (and wealth) is to be found. The state should facilitate these constructions and otherwise attempt to do no harm: "Once the networked information economy has stabilized and we come to understand the relative importance of voluntary private action outside of markets, the state can begin to adjust its policies to facilitate nonmarket action and to take advantage of its outputs to improve its own support for core liberal commitments."[32] Thus the relations of sovereignty

function in Benkler's thought primarily in the form of an antagonist, "the state," which is largely ignored or else held suspect. Actual politics, on this account, bears an obscure relation, at best, to "the state." For example, Benkler notes that "How we shall live in this new [technological] environment will in some significant measure depend on policy choices that we make over the next decade or so," and he argues further that "we must recognize that [these choices] are part of what is fundamentally a social and political choice."[33] But the political will motivating such choices remains curiously distinct from the organized, coercive power of "the state," as if the sovereign were not, at least in a democratic system, *we ourselves,* but someone else entirely: someone to be held at arm's length, to be bargained with cautiously, to be watched attentively. It is hard to see, on such an account, how the policies that Benkler rightly suggests that we need—such as limitations on intellectual property rights, a rolling back of copyright extensions, and support for public open-source platforms in a variety of different technical settings—could ever be enacted given the gulf he envisions between the non-dominated, solidaristic setting of the relations of sociability and the essentially unaccountable and unresponsive relations of sovereignty.

PROPERTY AND PRODUCTION

The problem with failing to appreciate the role of sovereignty—and imagining that flourishing relations of sociability can somehow endure independently of it—is not just that it distorts our understanding of politics but that it limits what we can grasp about the relations of sociability too. For example, if we consider why these new possibilities for a non-dominated sociability have arisen, Benkler directs us to new *technological* possibilities: the contours of the new network technologies that distribute access to the means of production widely and inclusively, allowing for new forms of "peer production" based on collaborative sharing in non-market contexts.[34] New technologies are no doubt part of the issue, but his argument takes us to the heart of a longer-running debate about the nature of property and its role in production. Benkler explains: "the primary raw materials in the information economy, unlike the industrial economy, are public goods—existing information, knowledge, and culture. Their actual marginal social cost is zero. Unless regulatory policy makes them purposefully expensive in order to sustain the proprietary business models, acquiring

raw materials also requires no financial capital outlay."[35] This is an argument that Benkler repeats at several points, drawing a contrast with the "industrial" mode of production that came before the new "information" economy. For example, he writes: "The capital cost of effective economic action in the industrial economy shunted sharing to its economic peripheries. . . . The emerging restructuring of capital investment in digital networks . . . [is] at least partly reversing that effect."[36]

Here and elsewhere, Benkler assumes that there is, straightforwardly, a "capital cost" that falls out (as it were) of the basic terms of the neoclassical production function in economic theory. But this assumes that the return to capital is independent of the social struggles that Benkler diagnoses in the current fight over control of the information economy. The truth is much more complex—as the so-called capital controversies of the 1950s revealed.[37] Indeed, the cost of capital is a function of a broader set of property relations, in the industrial as much as in the information economy. After all, property ownership mediates access to something, whether material or immaterial, in a *social* setting; it is purely a social relation, a relation among people, not between people and things. The complaint of left anarchists to the effect that "property is theft" (as Proudhon famously put it) was intended to suggest precisely this claim: that it is *labor* that is productive, and that the relations between labor and capital are neither natural nor necessary, but depend instead on background conditions of power operating through property.

Thus, instead of seeing the emergence of the networked information economy as linked in some critical way to the earlier efforts of the free software movement—for example, in the initial gifts of code by politically motivated actors like RMS which led to alternative regimes of shared property—Benkler emphasizes an allegedly natural "cost of capital" that happens now to be distributed in an arrangement more favorable to nondominated work relations. He argues: "The current networked stage of the information economy emerged when the barrier of high capital costs was removed. The total capital cost of communication and creation did not necessarily decline. Capital investment, however, became widely distributed in small dollops, owned by individuals connected in a network."[38] On this view, not only was the rise of the industrial economy a function of capital costs, considered naturalistically and thus as outside the social relations of contestation or struggle, but the information economy, too,

emerges necessarily from the structure of objective costs: "The rise of peer production is neither mysterious nor fickle when viewed through this lens. It is as rational and efficient given the objectives and material conditions of information production at the turn of the twenty-first century as the assembly line was for the conditions at the turn of the twentieth."[39]

This naively functionalist economic history is not intended ironically. Strikingly for someone concerned with the social relations of production, Benkler seems to have missed (or else is content to neglect for some other reason) the vigorous and lively debates that occurred in early industrialism over the justice and efficiency of capitalist production. Those debates matter today because their participants took positions that were in fact very similar to the sort of arguments now appearing in the open-source movement. Indeed, the fate of these earlier movements asserting a producerist ethic of workplace solidarity may very well be repeated, without a more sophisticated understanding of the complex interplay of politics and production in history.

The workers involved in those earlier struggles would not have accepted that there was a natural, non-exploitative "cost of capital" that determines one set of workplace relations rather than another—the assembly line then and shared digital platforms now. From their perspective, what Benkler calls the "capital cost of effective economic action" could not be considered a natural fact; rather, it emerged from a series of social and political struggles that these workers fought and lost. Indeed, they lost them in part because of the "predatory regulatory policy" that Benkler warns might artificially raise the cost of working together today, but that he does not acknowledge has lain behind every claim ever made regarding the ownership of the means of production, whether of code now or physical machines then. However, the claim of the laborers who took over their factories—and of the anarchist and socialist landlords and factory-owners who gave up their inheritances to found new cooperatives in fits of conscience and social experiment (rather like RMS and the GNU)—was that the allocation of property rights under law obscured the real nature of production. Like Benkler, they argued for greater freedom in workplace relations and for a new kind of share economy, but unlike Benkler they thought this was a realistic possibility in their time. Indeed, for the utopian radicals, Lockean socialists, producerists, anarcho-syndicalists and others who featured in the varied and dramatic world of early labor radicalism

seen in novel cults of production and science, free-labor communes, and unions, the industrial age promised a new form of production in which the constraints of the past might give way to the solidarity of laboring men. This new age of industrial technology (that Benkler claims was fixed within given economic parameters) seemed as promising to them then as the information economy does to us today.[40] These men had all they needed—so their story went, much as Benkler's goes now—to realize a new world of *social* production: they had their labor. Only their labor was creative, producing not just commodities but even the machines they worked on. Everything else—the alleged dictates of capital, the property claims of the factory owners, the proclamations of the paid politicians to respect "the system"—was just a cover for theft after one manner or another.[41]

ANARCHISM REVISITED

The reason for this brief excursus into labor history is that it supports a more general contention: that every new phase of production—for example, industrial at the end of the nineteenth century, "informational" today—has always begun with a temporary loosening of existing controls over labor, and thus of our settled ideas about the organization of production and the prerogatives of ownership, profit, and capital that attend it. People with the practical skills to participate in the vanguard form of production of their age, whether industrial laborers in the past or computer programmers in the present, often feel empowered and deeply involved in what they experience as a new age of emancipated work—at least, that is, until this kind of work, too, becomes routinized and alienated. The role of their labor in production is clear to them, as is the role of abstract claims to property in imposing obstacles to their work. The claim by free software guru RMS in 1979 that "all software should be free and charging money for software was a crime against humanity"[42] was thus but the latest iteration of Proudhon's argument that "property is theft." RMS's radical claim against property rested on the idea that control over social resources (the "means of production") unjustly and inefficiently privileges some people over others. He made this point succinctly in relation to intellectual property: "'Control over the use of one's ideas' really constitutes control over other people's lives; and it is usually used to make their lives more difficult."[43]

A struggle often follows the development of new productive capacities

when powerful parties attempt to take control of them for private profit by asserting special prerogatives or privileges of property. There are usually two responses made by those keen to defend what they see as emancipated forms of production against efforts to appropriate or privatize them. The first is to argue that only the organized politics of democratic sovereignty can preserve the productive, free relations of sociability made (temporarily) possible by the emergence of a new way of working together—a claim associated with Marxists as well as, in a different way, some socialists and liberals. The second, which has been argued by anarcho-syndicalists in the past and by techno-utopians now, is to imagine that we can do without sovereignty (corrupted in the past, as it is now) and focus instead on deepening and strengthening our solidarity in sociability. Every attempt to privately enclose productive resources—whether land, capital, or information—has always generated these two broad responses, in various guises and combinations.

The anarchist response is hostile to the state and hopeful that egalitarian forms of voluntarism will be able to hold out against private power, perhaps in part because they are more productive. For example, Benkler recognizes that current efforts to control free software and enclose the "digital commons" come from legal maneuvers by powerful private parties: "The political and judicial pressures to form an institutional ecology that is decidedly tilted in favor of proprietary business models are running head-on into the emerging social practices [of the open-source movement]."[44] However, his faith is not so much in reforming the relations of sovereignty such that they will be able to tilt the "institutional ecology" in the other direction (away from the corporations and in favor of peer production and a non-market, share economy) but in collections of diffuse social movements and NGOs: thus, more sociability to counter sociability. "There is already a more significant social movement than existed in the 1990s in the United States, in Europe, and around the world that is resisting current efforts to further enclose the information environment."[45] Yet how these movements—these forms of beneficent voluntarism in civil society—will counter private power without engaging organized politics is unclear.

This anarchist position seems committed to two beliefs about the state and its relation to individual agency. First, there is usually some version of the claim that, as Marx put it polemically, the state is but "the executive committee of the bourgeoisie," or, as a techno-utopian might argue today

(without necessarily grasping Marx's deeper structural argument), the government has been bought by Microsoft lobbyists. Marx didn't stop at that description, of course, but the anarcho-syndicalists do, moving from that assessment to a second, more dubious claim that private agency operating through virtuous or egalitarian relations of sociability is an appropriate and adequate response to the corruption of state power. This is the extraordinary thought that provoked some of Marx's frustration with Proudhon and fueled the later ideological battles between Marxists and their anarchist rivals on the left: that it is somehow easier or better to elude the state than to claim it for ourselves.

On the Marxist reading, however, the anarchist position is not so much a strategy as an error. For the relations of sovereignty do not exist beyond or outside us such that we can part ways with them, the better to take control of our immediate lives and circumstances. (Indeed, the anarchist response replicates the theoretical division between state and civil society that Marx put in a great deal of intellectual effort to overcome.) We cannot ever disengage from a corrupt state, since we cannot ever do without politics—at least not for very long and not for very many of us. We can only take it back, restoring the proper relations of sovereignty under which, subsequently, a set of subsidiary rules governing sociability can be put into effect. If there is a reason to form voluntary coalitions, such as the movements of NGOs that Benkler applauds, it must be as part of an effort to capture the power of sovereignty and put it to use in this way. On this view, organized political power is to be seen as the prize at the end of social struggle, because ultimately only centralized power can halt the enclosure of common resources by private parties and defend a robustly egalitarian vision of human flourishing. By contrast, on the anarchist view, organized politics appears as the threat against which, in a Sisyphean task, we are perpetually defending ourselves.

It would be a shame if we lost the evident advances that the new network technologies promise because of a conceptual confusion about politics and its role in production, both historically and currently. For even if the new digital economy offers an objectively more promising terrain for arrangements that favor non-dominated work relations than did, say, the nineteenth-century factory, it is also more distant to most people and, at least as the situation now stands, far from being a site of visibly organized resistance. The open-source movement should not suppose that it

can forever counter private economic power with private virtuous action —whether in the egalitarian social relations of online collaboration or through loosely coordinated attacks by hackers on monopolistic corporations—lest it end up, like anarcho-syndicalism in the early twentieth century, ceding the organized power of the state to its capitalist opponents. Then all that would remain of this latest producerist initiative would be to reflect nostalgically on the free Internet of the 1990s in the way that anarchists once looked back to the Barcelona of 1936: there, once and briefly, we ran things ourselves.

THE POLITICS OF FREE STANDARDS

Not all open-source or free software advocates imagine that the free relations of sociability could survive outside or beyond the state. Indeed, the original free software pioneers that started the whole movement with their gifts of labor, political commitment, and legal innovation have long recognized the importance of democratic politics in fostering the practical conditions for non-dominated relations of production. RMS in his *GNU Manifesto* and Eben Moglen in his amusingly titled *dotCommunist Manifesto* make it clear that the practical conditions for enduring anarchist production depend upon a favorable political background.[46]

The lawyers and law professors who, like Benkler, work to support these networked forms of production and distribution are also, on the whole, keenly aware of the necessity of politics. The inescapability of politics has become all the more clear as new and powerful forms of digital "enclosure" have been enacted in recent legislation, such as in the Digital Millennium Copyright Act of 1998. In this context, law professor Lawrence Lessig argues: "We will not reclaim a free culture by individual action alone. It will also take important reforms of laws. We have a long way to go before the politicians will listen to these ideas and implement these reforms."[47] Lessig recognizes that the maintenance of a free culture by private action alone is impossible. It requires collective political will—not just the virtuous actions of individuals—to preserve a free culture.

Another law professor who has written critically on these issues, James Boyle, argues that real freedom in the creation and distribution of intellectual property "must be taken through collective action and imagination, through the postulation of a fictive 'we' that becomes real only in the context of a practice which presupposes the very community it calls into

being." Boyle offers here a succinct and elegant definition of democratic sovereignty, of the "we" defined through politics capable of keeping a free culture unenclosed. Boyle continues, making the point even more explicit: "The intellectual land grab I have described here can be halted, and even pushed into reverse," but he recognizes that doing so will require that a general will be constituted through an organized politics.[48] Indeed, it seems unclear how much progress the free software movement can make today against the process of digital enclosure—enabled now by the sort of looser "open-source" licensing against which the GPL v. 3 is directed—without a public *political* commitment to egalitarian modes of production.

Once we see that the ultimate aim of the movement for "free software" is the autonomy that we have in our work relations with each other, and that this autonomy requires common, rather than private, control of the standards that we use in production, then our focus should shift to considering the kind of politics that can ensure public control of the digital means of production that we currently use, as well as any that may come to exist in the future. Importantly, a mobilized political will capable of defending a free networked information economy would not, naturally, have to be restricted to that purpose alone. It could be put into the service of unalienated and autonomous work relations elsewhere in the economy too—not only in the domain of high technology (where it might be relatively "less costly" to do so) but throughout the industrial economy, the whole of which is similarly governed by standards, proprietary and otherwise, that determine the ways in which we work together. Using sovereignty in this way would require serious political engagement and an effort to build support outside the programming community, in order to preserve and extend the non-dominated relations of production that currently exist within that domain. However, the alternative now being pursued is just the opposite: a retreat to the defense of particular networking platforms in a sort of digital last stand. Whether this will suffice remains to be seen. But it is hard not to suspect that the free networked information economy will not be able to survive in the long run unless today's techno-utopians abandon the errors of their anarchist forebears and fight for non-dominated forms of production in all sectors of the economy, as part of a broadly *political* program.