

PITT LAW

UNIVERSITY OF PITTSBURGH

Legal Studies Research Paper Series

Working Paper No. 2009-22

August 2009

Open Secrets

Michael J. Madison

University of Pittsburgh School of Law

3900 Forbes Avenue

Pittsburgh, Pennsylvania 15260-6900

www.law.pitt.edu

412.648.7855

E-mail: madison@pitt.edu

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OPEN SECRETS

Michael J. Madison *

I. Introduction

Both inside and outside the thing that the law calls a “trade *secret*” lie domains of *open* information exchange. Trade secrecy demands a corresponding openness precisely by virtue of the law’s requirement that the information may be protected as a trade secret provided that its secret status supplies its owner with economic value or a commercial advantage.¹ That advantage necessarily comes via exchange with others. Perhaps the most famous and commercially successful trade secret in history, Coca-Cola’s formula for its classic soft drink, is the foundation of millions of dollars in sales to consumers worldwide. The commercial software industry likewise distributes products containing its trade secrets to millions of end-users annually.

This Janus-like or two-faced character of trade secrets has long been an implicit feature of accounts of the law of trade secrets. The open character of trade secrets appears in accounts that analyse the doctrine in relational terms, when those accounts note that trade secrecy’s scope is usually limited to certain commercial or technical contexts. Information may be secret for purposes of interactions that are subject to special duties, such as those between employers and employees, and between business partners, but that same information may be accessible for other purposes, such as relations between a supplier and consumers, and between competitors. The latter groups ordinarily are entitled to access the secret, at least so long as they use “legitimate” means.

Openness also appears in accounts that focus on the thing-like character of the trade “information” that is held in secret,² in arguments that the law of trade secrets should be assimilated to other regimes of managed openness, such as patent and copyright law,³ or that trade secrecy is founded on the idea of possession and use that distinguish owned things from nature.⁴ Openness appears in accounts that emphasize the complementary nature of trade secret law and patent law. In that sense, disclosure via the latter mechanism and secrecy via the former are simply alternative mechanisms for appropriating value from technological innovation when those innovations are exploited commercially. Openness appears in accounts that note the transactions costs that burden licenses of secret information, known as Arrow’s Information Paradox.⁵ The prospective licensor is unlikely to disclose the secret information in the absence of

* Professor of Law and Associate Dean for Research, University of Pittsburgh School of Law. My thanks to participants in a Workshop on the Law of Trade Secrets held at the New York University School of Law in February 2009 for helpful comments on a preliminary version of this chapter.

¹ I focus here on trade secrecy rather than on the related but distinct concept of technical know-how.

² See Michael J. Madison, *Law as Design: Objects, Concepts, and Digital Things*, 56 CASE W. RES. L. REV. 381, 440-1 (2005).

³ See Mark A. Lemley, *The Surprising Virtues of Treating Trade Secrets as IP Rights*, 61 STAN. L. REV. 311 (2008).

⁴ See Adam Mossoff, *What Is Property? Putting the Pieces Back Together*, 45 ARIZ. L. REV. 371, 418 (2003) (describing the core of property as “rights to acquire, use, and dispose of things”); Carol M. Rose, *Possession as the Origin of Property*, 52 U. CHI. L. REV. 73, 79-85 (1985). A “commonly understood and shared set of symbols ... gives significance and form to what might seem the quintessentially individualistic act: the claim that one has, by “possession,” separated for oneself property from the great commons of unowned things.” *Id.* at 88.

⁵ See Lemley, *supra* note 3, at 336.

a promise by the prospective licensee not to use the secret information; the prospective licensee is unlikely to make the promise before the secret is disclosed.⁶ Both parties are navigating the boundary between what is secret and what is open.

This dialectical relationship between secrecy and openness distinguishes *trade* secrecy from other broader social uses of secrecy. Secrecy may be essential to the constitution of certain social groups. Some indigenous peoples want to preserve the secrecy of their sacred rituals not because they care to exploit them commercially but precisely and solely because the rituals are theirs and theirs alone.⁷ The same dialectic distinguishes trade *secrecy* from the types of open and public property that we more typically associate with commerce.⁸ This chapter explores a more explicit and general version of this point. Trade secrets and the law that defines and enforces them can be understood jointly in essentially structural terms, as managing boundaries between what is legally secret and what is legally public as part of broader social processes that construct and manage knowledge-related boundaries between groups. Quite aside from its possible role in promoting innovation,⁹ trade secret law manages the creation and existence of social groups, firms and institutions, and manages interfaces between groups and outsiders generally.¹⁰

The chapter is organized in the following way. Part II explores one model for that structural relationship, the idea of the information or knowledge commons, and it briefly describes how the major formal features of trade secret law map onto the idea of commons. The part presents the central observation of this chapter, the apparent paradox that trade secrecy might offer structural support for the concept of an institution designed primarily to support sharing of information. Part III supplies several brief illustrations of the commons/trade secrecy intersection. The structural dialectic between openness and secrecy exists in numerous different patterns, rather than in a single form. The examples in this Part illustrate but do not define the universe of all possible cases. Part IV concludes.

⁶ See Robert G. Bone, *A New Look at Trade Secret Law: Doctrine in Search of Justification*, 86 CAL. L. REV. 241, 280 (1998).

⁷ See MICHAEL F. BROWN, WHO OWNS NATIVE CULTURE? 13-14 (2003), reviewed in Carol M. Rose, *Property in All the Wrong Places?*, 114 YALE L.J. 991 (2005) (book review). In this context, generally there is no need to balance openness and secrecy.

⁸ See Carol Rose, *The Comedy of the Commons: Custom, Commerce, and Inherently Public Property*, 53 U. CHI. L. REV. 711, 769 (1986); Brett Frischmann, *An Economic Theory of Infrastructure and Commons Management*, 89 MINN. L. REV. 917 (2006).

⁹ See Lemley, *supra* note 3.

¹⁰ The purposes of boundary management are varied. I leave further exploration of the relationship between boundary management and the purposes of boundary management for another time. Cf. Dan L. Burk, *The Role of Patent Law in Knowledge Codification*, 23 BERKELEY TECH. L.J. 1009, 1018 (2008) (noting that apart from its role in constructing incentives to innovate, “intellectual property may have important effects on the structure of firms and of industries”).

Others have postulated that rival firms and communities of practitioners may rationally share technical know-how, both in order to optimize processes of innovation and in order to reinforce existing communities themselves. See Stephen R. Munzer, *Commons, Anticommons, and Community in Biotechnological Assets*, 10 THEORETICAL INQUIRIES L. 271 (2009); ERIC VON HIPPEL, *THE SOURCES OF INNOVATION* 76-92 (1988).

II. Trade Secrets and Commons

The relational secrecy that protects the commercial interests of a trade secret's owner may simultaneously promote broad social interests in access to, conservation and use of information. The process of protecting and defining a trade secret may simultaneously protect and define social activity inside a group, shield that activity from interference by others, and structure the interface between group insiders and those outside the group. Each of these features, and all of them in combination, support the proposition that secrets and the law of trade secrets may be used to create and protect commons.

A. What is Commons?

I use the phrase information or knowledge *commons* to describe collections of knowledge and knowledge resources that are contributed to and available for use in a limited, managed, legally-, technologically- and socially-constructed institution, organization or structure. A public library is a kind of knowledge commons that consists of books and other objects maintained in its collections. A patent pool is a kind of knowledge commons constructed by owners of patents to related technologies, who contribute those patents to the pool and make them available to members of the pool on standardized terms. An open source computer program is a kind of commons constructed by software developers who contribute code to that program and make that code available to others. The open Internet itself is a kind of knowledge commons, which consists of webpages and other data that are posted by Internet users to openly-accessible hosts and made available to all other Internet users.

Commons in this account are important and essential structures for managing the production, conservation and exploitation of knowledge in ways that are complementary to but distinct from markets, that is, from structures defined legally by individual entitlements and private ordering, and complementary to but distinct from custom and social norms. By design, commons are *open* institutions, but they are not open in a raw, chaotic sense ("open to all comers, who can take whatever they want so long as they pay the going rate") or open in a public domain sense ("free from legal restriction, and free for the taking and use"). Commons are open in the sense that law and related social institutions design and manage the resources in the commons so that commons members, and individuals and institutions organized in adjacent places, can produce, sustain and consume commons resources in a sensible way. The boundaries of the commons and governance by commons members guard against the threat of corruption, pollution or privatization of commons resources.

Commons resources may be more or less open and accessible; likewise, the membership of the community or collective that contributes to and manages those resources may be more or less open and changeable. This idea of an information or knowledge commons is borrowed from the work of Elinor Ostrom and her colleagues, who have developed a rich literature studying commons for natural resources – trees, fish, pastures, water, and so forth.¹¹

¹¹ See ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION (1990); Elinor Ostrom and Charlotte Hess, *A Framework for Analyzing the Knowledge Commons*, in UNDERSTANDING KNOWLEDGE AS A COMMONS: FROM THEORY TO PRACTICE (Charlotte Hess and Elinor Ostrom eds., 2007).

Madison, Frischmann, and Strandburg have incorporated Ostrom's commons framework into a modified platform for analyzing knowledge commons.¹² They argue that knowledge commons share many features with natural resource commons, with two major exceptions.

First, the resources that form the pool at the center of a natural resource commons are mostly given by nature's design. No law needs to create the lobsters that form the core of the Maine lobster fishery, which is the object of a major recent book on natural resource commons.¹³ By contrast, knowledge commons consist primarily of intangible knowledge resources, such as copyrightable works of authorship, patentable inventions, and even unowned or unownable facts and ideas, that are defined and given shape by relevant bodies of law, often, but not exclusively, bodies of intellectual property law. The construction and function of a knowledge commons is correspondingly more complex, but also potentially more flexible. As I argue below, the law of trade secrets is one of those sources of commons construction.

Second, the social benefits offered by commons accrue not solely or even primarily to the parties to the commons relationship. In the natural resources context, commons institutions govern relations between commons members, primarily for the benefit of commons members. The Maine lobster fishery thrives as a natural commons because a complex set of informal and formal rules ensures that local fishermen harvest just so many lobsters each season as will lead to a viable fishery in the next season. Lobster live to breed another generation; lobstermen sustain their livelihoods.

In the context of knowledge commons, there is the possibility of knowledge being produced and shared not only within commons, but also via parties and institutions that are adjacent to commons but are not inside it. The commons institution governs not only what happens inside the commons but also the relationships (including benefits and costs) between the commons and other groups and outsiders. What happens in commons does *not* stay in commons. For example, the Associated Press (AP) cooperative wire service is a kind of knowledge commons constructed by member media enterprises. The AP pool consists of news items generated by the AP itself (funded by member contributions) and by AP members, who both contribute news to the commons and rely on the contents of the commons to build and operate their own, distinct newspapers, magazines and other media outlets *for the intended benefit of their audiences*, whose access to information depends heavily on operation of the AP and similar wire operations. Frischmann and Lemley generalize the intended third party benefits of knowledge institutions, or the positive welfare effects of openness, as "spillovers."¹⁴ While commons arise and exist for a wide array of reasons, this "spillovers" feature suggests that commons can serve important roles in solving production and sustainability problems associated with the public goods nature of knowledge resources.¹⁵

B. Trade Secrecy as a Feature of Commons

¹² See Michael J. Madison, Brett M. Frischmann and Katherine J. Strandburg, *Constructing Commons in the Cultural Environment*, 95 CORNELL L. REV. 657 (2010).

¹³ See generally JAMES M. ACHESON, CAPTURING THE COMMONS: DEVISING INSTITUTIONS TO MANAGE THE MAINE LOBSTER INDUSTRY (2003).

¹⁴ See Brett M. Frischmann and Mark A. Lemley, *Spillovers*, 107 COLUM. L. REV. 257 (2007).

¹⁵ See Madison, Frischmann and Strandburg, *supra* note 12.

Recognizing and understanding the mechanics and purposes of a particular commons requires identifying and describing the mechanics of two essential elements: the knowledge or knowledge resources that constitute the commons, and the boundaries and boundary conditions that define what and who lie inside the commons, and what and who lie outside it. Commons is defined by what lies within, who has access to that material, and the rules and standards by which commons is governed.

Trade secret law, by virtue of its focus on secrecy, the legal requirement that the owner of a trade secret take reasonable precautions to maintain its secrecy, and liability standards that focus on breach of a duty of confidence or other use of improper means, can supply precisely the knowledge resources, boundary conditions and governance rules that commons requires. The two leading sources of the law of trade secrets, the Uniform Trade Secrets Act and the Restatement (First) of Torts, both can be deconstructed into three principal elements. Both begin with the proposition that some specific “information” lies at the heart of the trade secret owner’s claim. That information often consists of technical know-how, but it need not; non-technical information may constitute a trade secret. A successful claim of trade secret misappropriation requires proof that (1) the trade secret owner has exercised reasonable efforts to maintain the secrecy of the subject information;¹⁶ (2) the information derives actual or potential economic value or some business or competitive value from its secrecy;¹⁷ and (3) the defendant misappropriated the information via an act or disclosure that constitutes “improper means,” such as breach of an express or implied duty of confidentiality or industrial espionage.¹⁸ The Uniform Trade Secrets Act (UTSA), by design, captures a broader range of information as potential “trade secrets” and a broader range of conduct as improper conduct, than the Restatement does.¹⁹ For present purposes, the differences are not significant.

¹⁶ See Uniform Trade Secrets Act § 1, 14 U.L.A. 437 (1986).

¹⁷ See *id.* The Restatement definition, found in Section 757, comment b is: “A trade secret may consist of any formula, pattern, device or compilation of information which is used in one’s business, and which gives him an opportunity to obtain an advantage over competitors who do not know or use it. . . . [i]t is not simply information as to single or ephemeral events in the conduct of the business. . . . A trade secret is a process or device for continuous use in the operation of the business.” RESTATEMENT (FIRST) OF TORTS § 757 cmt. b (1939). The Restatement supplied six factors to consider in determining whether or not a trade secret exists: (1) the extent to which the information is known outside [the employer’s] business; (2) the extent to which it is known by employees and others involved in his business; (3) the extent of measures taken by him to guard the secrecy of the information; (4) the value of the information to him and to his competitors; (5) the amount of effort or money expended by him in developing the information; (6) the ease or difficulty with which the information could be properly acquired or duplicated by others. Though these factors were not brought forward into the UTSA, they are commonly used by courts in applying the UTSA. See, e.g., *Learning Curve Toys, Inc. v. Playwood Toys, Inc.*, 342 F.3d 714 (7th Cir. 2003) (applying Illinois version of the UTSA).

The extent to which the secret must create economic value varies from state to state. California’s version of the UTSA, for example, requires that the trade secret must provide a “substantial” business advantage over the competitors of the trade secret owner. See 2007 California Bar Model Jury Instructions, available at http://www.calbar.ca.gov/calbar/pdfs/sections/ipsection/tradesecrets/2007-12_caci-trade-secret-jury-instructions.pdf.

This discussion elides the possible distinction between the proposition that the subject information must constitute “a secret,” on the one hand, and the alternative construction that the information need not be “a secret” but rather should be the subject of efforts to maintain its secrecy, even if the information is not, on all readings, “a secret.”

¹⁸ See Uniform Trade Secrets Act § 1.

¹⁹ See Lemley, *supra* note 3; Michael Risch, *Why Do We Have Trade Secrets?*, 11 MARQ. INTELL. PROP. L. REV. 1 (2007).

The three basic elements of trade secrecy, when viewed in the context of a knowledge commons, can be mapped onto means for defining and maintaining commons, resources, membership, and governance. Secrecy, which in some accounts of trade secret law amounts to a puzzling “bug” to be explained,²⁰ may instead be a “feature” of certain commons. Misappropriating a trade *secret* may be regarded as unlawful because of the harm that the misappropriation does to the operation of a commons. The fact that the secret relates to *trade* (or business, or commerce) is part of the social motor that drives the open/secret commons in the first place. In other words, trade secrets may constitute the resources that are conserved and managed in a knowledge commons, allowing the community of members in the commons to flourish and structuring the interface between development and conservation of secret information inside the commons, on the one hand, and commercial exploitation of the secret information beyond the commons, on the other hand. Conduct that undermines that institutional arrangement is punished by the law as misappropriation.

The following sections describe the mapping between the doctrinal elements of a claim of trade secret misappropriation and the structural elements of a knowledge commons, especially with regard to resource definition, commons membership, and boundary management issues, in greater detail. Part III then shifts from formal argument to illustrations taken from real world commons that are built wholly or partly from trade secret resources.

(1) *Trade secret definition and commons resources*

The first and most elemental attribute both of a trade secrets lawsuit and of a knowledge commons is a definition of those informational things that comprise it. A trade secret plaintiff is expected to identify and describe the information that it seeks to protect.²¹ The “item” may be a process, formula, method or list; it may be the product of technological research or the subject matter of a confidentiality agreement between actual or prospective business partners. The secret is something that may be constructed as part of business operations, as part of business negotiations, or even (often, in fact) as part of the process of prosecuting a lawsuit.²² The knowledge resources that constitute a commons are likewise constituted in any number of different ways: via the practices of an individual actor or firm as part of an industry or discipline; as part and parcel of legal processes that recognize intellectual property assets (patent law, copyright law); or in other ways.

In trade secrets and commons contexts, these paired questions – “what is the thing?” and “how did it come to be part of a complex business or commercial relationship?” – are close cousins. Answering them with regard to any particular trade secrets lawsuit (and with regard to a possible commons) requires answering more specific subsidiary questions, including how much time, money and effort has gone into creation of the information (that is, is the information squarely part of the commons) and who does and who does not have authorized access to the information (who is a commons “insider” and who is on the outside). Defining the trade secret defines what is in the commons, who has access to it and on what terms.

Importantly, the “reasonable measures” requirement with respect to secrecy signals that secrecy (and its counterpart, openness) is both a legal and a cultural construct, not an innate characteristic of the information. The requirement provides a doctrinal and policy tool for

²⁰ See Dan L. Burk, *Muddy Rules for Cyberspace*, 21 CARDOZO L. REV. 121, 173 (1999).

²¹ See, e.g., *MAI Sys. Corp. v. Peak Computer, Inc.*, 991 F.2d 511 (9th Cir. 1993).

²² See Risch, *supra* note 19.

adjusting the line between what is secret and what is “open,” or the degree to which “openness” is permitted or required. To a sizable degree, the law of trade secrets demands that trade secret information be “open,” for others to appropriate lawfully. The U.S. Supreme Court held in *Kewanee Oil Co. v. Bicron Corp.*²³ that trade secret law must permit “reverse engineering” of the trade secret by non-owners in order to maintain its consistency with federal patent law. Openness can be achieved in more than one way.

Consider the famous case of *E. I. duPont deNemours & Co. v. Christopher*,²⁴ in which the owner of trade secrets in a partially completed methanol plant was able to obtain relief against photographers who flew over the plant, likely at the request of a competitor who wished to learn the plant’s secrets. Given the fact that the plant was readily observable from above, the court gave an entirely constructed meaning to the line between what was secret, in that case, and what was “open.”

(2) *Business advantage and commons membership*

As suggested by the paired questions above – “what is the thing?” and “how did it become part of the relationship in question?” – the definition of membership is closely aligned with the definition of the trade secret. Membership in the trade secret context is defined partly prospectively and positively, by virtue of an employment relationship, business partnership arrangement or other express duty of confidentiality. Membership is defined partly retrospectively, by virtue of a judicially-imposed duty of proper competitive behavior. This combination of formal and informal (or positive and normative) membership standards mirrors the positive and normative standards that define who is entitled to contribute to and take resources from a commons.

In any commons context, there is necessarily an interface between what and who exists inside the commons, on the one hand, and those institutions and individuals who operate outside that commons and deal with it, with its members, and with its resources at arms’ length or on other non-member terms, on the other hand. That interface is captured by what Frischmann and Lemley called “spillovers,” as resources in the commons are managed and leveraged in ways that provide benefits to people outside the commons. The commons is, as noted earlier, at least partly open, on terms defined in the context of each particular example.

In trade secret law, the interface between what is secret and what is open is also governed by the requirement that information to be protected as a trade secret offer its owner some (actual or potential) business or competitive advantage by virtue of its secrecy. The business/commercial requirement mandates that what is secret be of value in relation to what is part of the (open) marketplace. Purely personal, social or religious information rarely has actual or potential commercial value; such information may be intended to erect a boundary between inside and outside but is rarely designed or intended to govern an interface between who and what is part of the institution that controls its secrecy, on the one hand, and other, unrelated interests, on the other hand. Coca-Cola and Microsoft rely on trade secrecy to govern their relationships with consumers; a church guards secret doctrines to ensure the integrity of its rituals.

(3) *Misappropriation and commons governance*

²³ 416 U.S. 470 (1974).

²⁴ 431 F.2d 1012 (5th Cir. 1970).

The details of the interface between the trade secret owner and its customers, and between commons and outside interests, matter intensely, of course. In the trade secrets context, the interface is governed by the requirement that a defendant is liable only for having used improper means to obtain the secret, either by breaching a duty of confidentiality or, as in the case of the aerial spy in *Christopher*, otherwise breaching some obligation of fair competition. The best known example of proper means in trade secret law, the well-known exception for competitors who engage in reverse engineering of an object or process that embodies a trade secret, illustrates the proposition perfectly. The exception for reverse engineering exists in large part to ensure that trade secrets owners cannot control information through secrecy that public policy deems significant to (fair) open market competition or (open) technological progress, or both.²⁵

Governance of a knowledge commons requires a comparably detailed inquiry into what is proper conduct with regard to contributing resources to the commons, extracting resources from the commons, and otherwise exploiting or conserving commons resources. Trade secrets cannot be appropriated via “improper means,” a standard that reflects a combination of formal and informal normative guides reflected in contracts, duties implied by law, and courts’ sense of commercial morality. Commons resources are likewise governed by formal and informal rules that dictate “appropriate” management. Governance in the commons context includes formal rules embodied in agreements, statutes and other formal sets of rules, and informal rules reflected in community norms, all establishing and monitoring membership and resource consumption and setting and enforcing sanctions for violations.²⁶

In both situations, the point of governance is partly to ensure that the resources and people governed can accomplish their purpose, that is, to ensure the successful conveyance of knowledge from secret status to open status, in modified form. Preserving the secrecy of Coca-Cola’s secret formula assures the company that it can produce and sell soft drinks in the open commercial marketplace. A famous early patent pool, a species of knowledge commons, was organized among the producers of airplanes, each of whom owned patents necessary to aircraft production, so that cross-licensing could be implemented and planes could fill the skies above World War I.²⁷

The point of governance also may be to ensure the continuing stability and evolution of the trade secret-owning or commons-inhabiting social group or institution itself. One of the persistent puzzles of the law of trade secrets is what organizing principle makes that body of law comprehensible.²⁸ Some parts of the law are grounded in property law, others in tort; some seem aligned with innovation policy, others with competition and fair dealing. The suggestion here is

²⁵ See Pamela Samuelson and Suzanne Scotchmer, *The Law and Economics of Reverse Engineering*, 111 YALE L.J. 1575 (2002).

²⁶ The discussion in this Part does not exhaust the possible mappings of trade secrets and trade secret law onto a framework for analysing a knowledge commons. For example, a central question in commons analysis is the composition of the community that has access to commons resources. That community is usually characterized by a degree of openness that is governed by community members themselves, who decide who is and who is not permitted to access commons resources. The law of trade secrecy imposes a counterpart requirement that the trade secret owner exercise “reasonable measures” to maintain the secrecy of the protected information, rather than that the trade secret owner maintain the information in absolute secrecy.

²⁷ See Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations*, 84 CAL. L. REV. 1293, 1343-6 (1996).

²⁸ See Bone, *supra* note 6.

that if an organizing principle is needed (and it may not be), that principle may be found not in the things that trade secret law produces but in the social arrangements that it enables. Trade secrets, the institutions that create and control them, and the rules those institutions create and use to govern the secrets, are interlinked devices that sustain distinct and legitimate forms of social organization.

A knowledge commons is far from the only social organization that this body of law may support. Indeed, trade secrecy is perhaps most closely associated with industrial firms. It is important to recognize, however, that trade secret law supports a variety of institutions, not only industrial firms, and that what those institutions share is a managed or governed boundary, policed by the law and other things, between what is secret, on the one hand, and what is open, on the other hand.²⁹ Among those institutions are those that are designed with the sharing of information as one of their core objectives. Trade secret law may support a knowledge commons; a knowledge commons may consist in part of trade secret information. The legitimacy of the institution emerges from its structure, not only from its output.³⁰

Understanding not only why and how trade secret law feeds industrial firms much of the time, but also that it can be understood in the context of other social structures, such as knowledge commons, requires sensitive case-by-case analysis. The next part offers some brief examples.

III. **Creating and Protecting Commons Through Secrecy**

The claim here is not that trade secrets are always necessary to the creation and maintenance of a knowledge commons. The general purpose personal computer and its operating system/application software environment formed a kind of knowledge commons for the benefit of consumers and software developers that was maintained, in part, by the trade secret status of certain relevant Microsoft technology.³¹ It is possible, and some might say even likely, that an equivalent commons might have emerged in the absence of Microsoft's market position and trade secret strategy, and/or that the modern Internet represents the demise of the personal computing "commons" and its replacement by something different. The high-velocity labor market that characterizes the Silicon Valley's high technology industries is a sort of trade secret-based knowledge commons³² that might have emerged for different reasons.

²⁹ On "law" defined as a mechanism for communication among social actors and as a system for stabilizing the normative expectations of participants in those systems by recursively selecting norms to protect, which interacts with other systems of social communication, see NIKLAS LUHMANN, *LAW AS A SOCIAL SYSTEM* 93 (2004); cf. ANTHONY GIDDENS, *THE CONSTITUTION OF SOCIETY: OUTLINE OF THE THEORY OF STRUCTURATION* 162 (1984) (describing structuration as the mutually constituting interaction of individuals (actions) and groups (rules); Jack M. Balkin, *Respect-Worthy: Frank Michelman and the Legitimate Constitution*, 39 *TULSA L. REV.* 485 (2004) (identifying a "feedback effect" between popular interpretations and institutional effects as a necessary feature of certain theories of constitutional legitimacy).

³⁰ Secrecy in institutional settings designed for sharing knowledge can be contrasted with secrecy in traditional knowledge settings referred to earlier, *see supra* note 7 and accompanying text, in which the point of governance is to keep knowledge from migrating beyond the group.

³¹ See JONATHAN ZITTRAIN, *THE FUTURE OF THE INTERNET – AND HOW TO STOP IT* (2008).

³² See Alan Hyde, *The Wealth of Shared Information: Silicon Valley's High-Velocity Labor Market, Endogenous Economic Growth, and the Law of Trade Secrets* (Sept. 1998) (unpublished paper, available at <http://andromeda.rutgers.edu/~hyde/>); ALAN HYDE, *WORKING IN SILICON VALLEY: ECONOMIC AND LEGAL ANALYSIS OF A HIGH-VELOCITY LABOR MARKET* (2003); ANNALEE SAXENIAN, *REGIONAL ADVANTAGE: CULTURE*

Nor do I argue that commons defined in part by trade secret law are necessarily welfare-enhancing or even, speaking anecdotally, good things. Normative assessment of any commons requires developing and applying normative criteria. Whether any given institution or practice is a good thing, and why a trade secret-based institution might be chosen over some alternative, are important and interesting questions that await further analysis.³³ The discussion here focuses principally on description.

The claim instead is that trade secrets and the law of trade secrets can serve a structural function, that is, can be integral to the management of a knowledge-related institution, such as a commons. This part highlights several different ways in which trade secret law intersects with knowledge commons, as a complement to other, related commons-reinforcing mechanisms: physical boundaries, the definition of boundary resources, social norms and customs, traditions and histories, and subsidies and privileges reflected in the law. Neither trade secret law, trade secrecy, nor secrecy alone is sufficient, alone, to sustain a commons.

The point in each example below is that trade secrecy is not only or not necessarily a means of promoting innovation and creativity by or among those who are part of the commons itself. In the examples below, the boundaries and managed openness supplied by trade secrecy serve as means of ensuring that commons resources remain available not only to commons participants but also to those who interact with the commons via spillovers. Through trade secrecy, commons resources are available for use in processes of innovation and creativity, or are preserved and sustained against possible corruption, pollution or unintended privatization, or both.

A. Secrets as Commons Resources

A knowledge commons requires commons resources, knowledge objects or things that are produced in the commons, contributed to the commons, and/or appropriated from the commons. Trade secrets can be those things.

An example of a trade secret commons in this sense is the BioForge project organized under the auspices of the CAMBIA BiOS initiative.³⁴ The BiOS initiative aims to support open

AND COMPETITION IN SILICON VALLEY AND ROUTE 128 (1996); Ronald J. Gilson, *The Legal Infrastructure of High Technology Industrial Districts: Silicon Valley, Route 128, and Covenants Not to Compete*, 74 N.Y.U. L. REV. 575 (1999). Mark Lemley's claim that software companies routinely ignore patents offers indirect support for the claim. See Mark A. Lemley, *Ignoring Patents*, 2008 MICH. ST. L. REV. 19.

³³ As an example of an alternative strategy, Von Hippel and von Krogh explore the possibility that innovators may intentionally choose a strategy of "free revealing" of the workings of novel products and services. See Eric von Hippel and Georg von Krogh, *Free Revealing and the Private-Collective Model for Innovation Incentives*, 36 R&D MANAGEMENT 295 (2006).

³⁴ See BioForge, <http://www.cambia.org/daisy/cambia/4292> (last visited February 1, 2010). CAMBIA stands for Center for Application of Molecular Biology to International Agriculture, an Australian nonprofit organization. BiOS is CAMBIA's Biological Innovation for Open Society initiative. Emerging cousins of the BioForge initiative, attempting to use patent rights to build managed commons of research in synthetic biology, include the BioBricks Foundation and the MIT Registry of Standard Biological Parts. See the BioBricks Foundation, <http://bbf.openwetware.org/> (last visited February 1, 2010); Registry of Standard Biological Parts, http://partsregistry.org/Main_Page (last visited July 1, 2009). These represent efforts to map concepts from the Free and Open Source Software movement onto biological research, by using strong (patent) rights to avoid rather than reinforce the potentially stifling "thicket" of abundant patent claims on complementary technologies. One leading commentary on the design of commons institutions for synthetic biology recognizes that the mapping is awkward,

source biotechnology, using an open, shared model of research results that mirrors the successful model used by open source software communities (which are themselves examples of knowledge commons, grounded in copyright law and software licenses).

By contrast to open source software initiatives, the biotechnology domain is governed in the first place by patent law, and a difference between patent law and copyright law drives a key feature of the BioForge framework. In copyright law, public disclosure of a copyrighted work of authorship does not affect the scope of the copyright owner's exclusive right. Instead, even after publishing the work, the copyright owner retains the exclusive right to republish and distribute copies. An open source software license acts, in part, to place conditions on the authorized exercise of that right by an authorized user or modifier of the licensed work of authorship.³⁵ In patent law, open disclosure of an invention prior to patenting may invalidate the patent and undermine incentives to commercialize new technologies that are supplied by the patent system. On the whole, therefore, the patent system is designed to discourage early publication of inventions but encourage publication that accompanies patenting. In the context of scientific research, however, this "pull of patents," to use Frischmann's phrase,³⁶ may lead to a reluctance or even unwillingness of researchers to share research results, because of the fear that they might jeopardize later commercialization opportunities. The insight of the promoters of BioForge is that open sharing of research results may co-exist with an institutional structure that accommodates the desire to commercialize.

Thus, participants in BioForge projects coordinate research communities via websites for publication and sharing of biotechnology inventions, including not only potentially patentable information but also related business and technical know-how, including trade secrets.³⁷ The temporal sequence here involves first constructing a commons via legal instruments that define membership, governance rules and the relevant resource types, then contributing research results and techniques, including trade secrets. Within the defined commons, community members are entitled to free use and free distribution of those inventions and know-how among members of the group. (Technology developed in the commons may be transferred outside for commercial development.) Importantly, the commons consists not only of the shared portfolio of research and (bio)technology, but also a constructed space within which commons participants can discuss their work *in confidence*.³⁸ So long as discussions take place inside the commons, or what the BIOS initiative refers to as a non-public "protected" commons, then they are (according to BIOS) non-public and therefore not subject to claims that later patents are invalid on prior disclosure grounds.³⁹ Assuming that the institutional structure works as intended, both in the

but it does not mention trade secret law. See Arti K. Rai and James Boyle, *Synthetic Biology: Caught Between Property Rights, the Public Domain, and the Commons*, 5 PLOS BIOLOGY e58 (2007), available at <http://www.plosbiology.org/article/info%3Adoi%2F10.1371%2Fjournal.pbio.0050058>.

³⁵ See *Jacobsen v. Katzer*, 535 F.3d 1373 (Fed. Cir. 2008).

³⁶ See Brett M. Frischmann, *The Pull of Patents*, 77 FORDHAM L. REV. 2143 (2009).

³⁷ See BioForge, *supra* note 34.

³⁸ See *id.*

³⁹ For discussions of the BioForge project, see Robin Feldman, *Open Source, and Open Transfer: Market Approaches to Research Bottlenecks*, 7 NW. J. TECH. & INTELL. PROP. 14 (2008); Joseph Eng, Jr., *From Software to Life Sciences: The Spreading of the Open Source Production to New Technological Areas*, 24 TEMP. J. SCI. TECH. & ENVTL. L. 419 (2005); Stephen M. Maurer, *Open Source Drug Discovery: Finding a Niche (or Maybe Several)*, 76 UMKC L. REV. 405 (2007). The mechanics of BioForge are not fairly characterized as an open source software commons might be, as constructed from so many different property claims that it constitutes a "comedy of the

sense that the legal forms are regarded as legitimate and in the sense that BioForge attracts members who participate according to its intended set of norms, then BioForge members can preserve the benefits of both secrecy, from a patent law perspective (where loss of secrecy via publication would defeat potential patent rights), and openness, from a shared research perspective. Recursive development, contribution and use of both secret and public commons resources according to the terms of the BioForge charter is the engine that may sustain the commons.

Neither trade secrets nor trade secret law create this particular commons, but there is a specific relationship between trade secrets and commons in this case. The BioForge commons both exists despite trade secret law, because of the need to accommodate the demands of patent law in this scientific research context, and relies on trade secret law. The impact of trade secret law on the commons structure is specific: it supplies a legal standard – “reasonable measures” to ensure secrecy – by which BioForge promoters and members hope to preserve the “secret” status of shared research. Patent law pressures researchers not to publish their results before patenting. The BioForge construct enables researchers to retain the benefits of pre-patenting secrecy, while enjoying the science-related benefits of openness.

B. Secrets and Boundary Conditions

The BioForge project is novel. The claim that a “protected commons” shields internal discussions of inventions from characterization as “public” for patent law purposes is untested.⁴⁰ And it is not clear that the project has attracted or will attract a mass of researchers that is large enough to sustain a meaningful amount of innovation under the BioForge umbrella.

Two far less technologically chic examples illustrate a related but distinct use of trade secrecy to define and protect a commons. Both examples were developed originally as case studies of social norms that offer appropriation mechanisms that are equal or superior to copyright or patent rights in promoting innovation and creativity. Both, however, indirectly shed light on norm-based commons defined by trade secrecy, with trade secrets serving partly as commons resources but more importantly as boundary objects.⁴¹ Access to trade secrets defines who is part of the commons and has access to its resources (and who is therefore subject to a normative duty to protect its secrets) and define measures of fair behavior in participating in and competing with the commons, that is, proper and improper “means” of accessing trade secret information.

anticommons,” or so fragmented in property terms that it is effectively immunized from privatization by any one party.

⁴⁰ A related proposal by Keith Aoki offers a “limited commons” over secret information as a mechanism for protecting classes of traditional knowledge. See Keith Aoki, *Weeds, Seeds and Deeds: Recent Skirmishes in the Seed Wars*, 11 *CARDOZO J. INT’L & COMP. L.* 247 (2003) (arguing for a “limited commons” approach to address problems presented by intellectual property protection of traditional knowledge); Gelvina Rodriguez Stevenson, *Trade Secrets: The Secret to Protecting Indigenous Ethnobiological (Medicinal) Knowledge*, 32 *N.Y.U. J. INT’L L. & POL.* 1119 (2000).

⁴¹ See Shubha Ghosh, *Patent Law and the Assurance Game: Refitting Intellectual Property in the Box of Regulation*, 18 *CAN. J. L. & JURISPRUDENCE* 307, 318-19 (2005) (comparing Mertonian scientific commons to the commercial market and describing trade secrecy as barriers to entry in both); Steven Wilf, *Trade Secrets, Property, and Social Relations*, 34 *CONN. L. REV.* 787, 796 (2002) (describing property boundaries as two sides of a common coin, involving both a duty to police and a right to exclude).

Fauchart and von Hippel describe the community of French chefs and the measures that they take to protect the distinct techniques and recipes that define their discipline.⁴² The rules governing the community of chefs are recognized and enforced as informal but regular norms that mirror the law of trade secrets in some respects. Fauchart and von Hippel summarize a key finding of their research as follows:

The community acknowledges the right of a recipe inventor to exclude others from practicing his invention, even if all the information required to do so is publicly available. A second norm mandates that, if a chef reveals recipe-related secret information to a colleague, that chef must not pass the information on to others without permission. This norm gives a chef a property right similar to that attainable via a contract under trade secrecy law. That is, protected by this norm, a chef can *selectively* reveal his secret information to another without fearing that as a result, the information will become generally known.⁴³

Related norms dealt with what the authors call “honorable” (or a trade secret lawyer might call “proper”) behavior. A chef receiving a recipe in confidence from another chef is honor-bound not to perform the recipe exactly, and to acknowledge the source of the recipe in contexts, such as cookbooks or cooking shows, where disclosing the source might be contextually appropriate.⁴⁴ Finally, there is a disciplinary norm:

As one accomplished chef said: “If another chef copies a recipe exactly we are very furious; we will not talk to this chef anymore, and we won’t communicate information to him in the future.”⁴⁵

Importantly for purposes of assimilating trade secrets to boundary objects in the commons, the discipline applied to violators of the chefs’ code is, in effect, banishment from the community. The commons consists of recipes as trade secrets; trade secrecy simultaneously defines the community. In contrast to the BioForge example, the temporal sequence in this description involves secrecy and commons community co-evolving, simultaneously.

In a similar spirit, Loshin describes social norms that govern development of, access to and use of magic tricks by the community of practicing magicians.⁴⁶ In many respects, magicians and chefs use trade secrecy to similar effect. But there are important differences. Loshin describes three types of “secret” tricks, what he characterizes as “popular” magic (which is hardly secret at all), “common” magic shared widely among magicians, and “proprietary” magic shared selectively among practicing professionals. These levels of secrecy both constitute and are reinforced by commons and community boundaries. He describes the chief risk to the magicians’ commons (a term that I ascribe to his framework, rather than a term that he invokes)

⁴² See Emmanuelle Fauchart and Eric von Hippel, *Norms-Based Intellectual Property Systems: The Case of French Chefs*, 19 ORG. SCI. 187 (2008).

⁴³ *Id.*

⁴⁴ Serving a meal based on the recipe does not necessarily imply sharing the recipe itself; even reciting the formal recipe might not constitute disclosure of secret disciplinary techniques needed to execute the recipe properly. In both senses, the secrets are maintained in the corps of chefs while gastronomes can enjoy French restaurants and cookbooks. Strandburg develops the related distinction between self-disclosing and non-self-disclosing inventions in her analysis of the experimental use defense in patent law. See Katherine J. Strandburg, *What Does the Public Get? Experimental Use and the Patent Bargain*, 2004 WIS. L. REV. 81, 104-18.

⁴⁵ See Fauchart and von Hippel, *supra* note 42.

⁴⁶ See Jacob Loshin, *Secrets Revealed: How Magicians Protect Intellectual Property Without Law*, in LAW AND MAGIC: A COLLECTION OF ESSAYS (Christine A. Corcos ed., 2009), available at <http://ssrn.com/abstract=1005564>.

not as unacknowledged copying, as in the cooking context, but exposure of the secret itself to the world beyond the magicians' community.

In these two examples, trade secrecy serves related but different roles in guarding the interface between insiders and outsiders, and between what is secret and what is open, when compared with the BioForge example. First, the law of trade secrets is doing relatively little work in defining and managing the chefs' and magicians' commons and the resources within it. Instead, communal norms define what is secret and what is not and the obligations that accompany each status. What is noteworthy, however, is not the relative unimportance of formal law but how the commons is constructed via social structures that echo formal law so closely. (In a different sense, the relative unimportance of formal intellectual property law in these "creative" domains was part of the point of the original research. It is possible, in fact, to consider recipes for *haute cuisine* not to be trade secrets in the legal sense at all, precisely because the risk of misappropriation by non-chefs is so low. These recipes may be known to non-chefs, yet protected from misappropriation by them because non-chefs lack the expertise to execute the recipes.) Second, whereas BioForge members structured their commons to ensure secrecy on the inside and openness (and commercial marketability) with respect to the outside, French chefs necessarily share certain features of their secrets with the marketplace (those who eat at fine French restaurants). Any particular dish necessarily embodies openness and secrecy all at once, both inside and outside the commons. Magicians, by contrast, expect graded openness on the inside and absolute secrecy with respect to the outside marketplace.

The point is that in the commons context, secrets and trade secrets do not come in a single flavor. Openness of the resource and openness of the community are measured relative to context. Making magicians' secrets accessible to lay audiences would disrupt the magicians' commons; magicians care both about the secrecy of the content and access by non-magicians. Serving food prepared using chefs' secrets not only would not disrupt the chefs' commons but might even reinforce it, to the extent that the restaurant experience ratifies the distinctive status of the chefs; French chefs care differently (and perhaps less) about the content of the "secret recipes" but care very much about who, precisely, has access to them.

C. Secret Methods and Constructing a Commons

A final example of commons structured via trade secrets is Google's search engine results. In this instance, the results themselves constitute the commons, which are open and available for use by anyone with access to Google's service. The relevant trade secrets are Google's secret methods for compiling results in response to a given search query.

The fact that Google's search algorithms are largely secret, like those of most Internet search engines, is indisputable.⁴⁷ Google and other firms have patent portfolios related to their search technologies, which expose certain aspects of search and its methods to public view via the disclosures associated with patenting. But maintaining the secrecy of search methods, including the mechanics of Google's PageRank algorithm, is necessary, according to Google, both to ensure that Google maintains its competitive advantage relative to other search engines

⁴⁷ See James Grimmelman, *The Structure of Search Engine Law*, 93 IOWA L. REV. 1, 48-50 (2007).

and to prevent third parties from “gaming” search results in their favor.⁴⁸ Google has been subject to claims by firms that allege that their status in Google’s search results has been diminished unfairly. Google has largely prevailed on those claims, partly on the ground that Google is deemed to have a free speech interest in its search results as “speech”⁴⁹ and, more important for present purposes, on the ground that Google’s use of secret methods to compile search results does not amount to anticompetitive conduct.⁵⁰ Even more significantly, Google has successfully resisted enforcement of a government subpoena for search-related data on trade secret grounds.⁵¹

What does trade secrecy buy in this example, not only from Google’s perspective, but in light of the commons framework? Here, trade secrecy offers a direction to the spillovers that are important parts of a knowledge commons. As Frischmann writes, not only is the World Wide Web or the Internet an open information commons,⁵² but the search landscape provided by private firms is a structured commons nested inside the Internet’s broader commons framework.⁵³ The fact that this latter commons is managed by a private firm raises questions of degree but not character. Google is not akin to Coca-Cola, simply selling a product (or service) that is constructed via secret methods. Search results and the information to which they link are commons resources in the sense that they are produced and supplied in a political and technological environment that is open by design for use by anyone, for any purpose. Any user of the World Wide Web can create a resource that will be searched by Google; any user who searches the Web via Google can use its search results. Search results and the information to which they link offer precisely the kind of spillover benefits to users that often define knowledge commons. The beneficiaries of the commons governed in part by Google’s search technologies may not be the users for whom Internet resources were designed or intended. Yet those search results, as managed by Google, are the products of largely secret processes. Google asserts that Google users “trust” its results and that the secrecy of Google’s algorithms is necessary to maintain the integrity of those results. Trust, protected by Google’s claims of trade secrecy, helps to assure that the spillover mechanism operates as Internet users expect and intend.⁵⁴

It should be noted that the structural relationship between trade secrecy and commons does not necessarily promote social welfare. The fact that Google’s secret methods contribute substantially to the construction of a search results commons is precisely the point at which Google’s critics engage with the company. Bracha and Pasquale argue forcefully that harmful

⁴⁸ Google argues that “trust” in search is a vital part of the user experience. See *Gonzales v. Google*, 234 F.R.D. 674, 683-84 (N.D. Cal. 2006).

⁴⁹ See *Search King, Inc. v. Google Tech., Inc.*, No. CIV-02-1457-M, 2003 WL 21464568, at *2-5 (W.D. Okla. May 27, 2003); *Kinderstart.com LLC v. Google, Inc.*, No. C 06-2057 JF (RS), 2006 WL 3246596, at *4-7 (N.D. Cal. July 13, 2006).

⁵⁰ See *Kinderstart.com*, 2007 WL 831806.

⁵¹ See *Gonzales v. Google*, 234 F.R.D. at 686.

⁵² See Michael A. Carrier and Greg Lastowka, *Against Cyberproperty*, 22 *BERKELEY TECH. L.J.* 1485, 1506-07 (2007).

⁵³ See Brett M. Frischmann, *Cultural Environment and The Wealth of Networks*, 74 *U. CHI. L. REV.* 1083, 1112 (2007) (reviewing YOCHAI BENKLER, *THE WEALTH OF NETWORKS: HOW SOCIAL PRODUCTION TRANSFORMS MARKETS AND FREEDOM* (2006)).

⁵⁴ There is a parallel here between the role of trade secrecy in structuring a search commons and the role of trade secrecy in Microsoft’s provision of certain technology that enabled the development of the open architecture of the personal computer. See note 31 *supra* and accompanying text.

information asymmetries exist between search firms and consumers, which they trace largely to the secrecy of search engine algorithms.⁵⁵ Instead, the openness and salience of search results in the contemporary knowledge economy, and the information that is linked to in those results – the commons role of search, in other words – means that government supervision of search results is both appropriate and consistent with search engines’ interests in protecting their trade secrets.⁵⁶

Reasonable people may disagree about the possibility that “neutral” search results are possible under any scenario, let alone under the guidance of government regulators,⁵⁷ but the role of secrecy in constructing this commons seems uncontested. Equally important and distinctive is the role of the law of trade secrets in defining the scope of what is secret, and what is not, about Google’s search technologies. Like French chefs, whose meals do not disclose secret recipes and techniques, Google’s search results do not disclose its secret search algorithms. In Google’s case, however, unlike the chefs’, the firm relies explicitly on formal trade secret law to define its own interests and the scope of what is open and what is not in the commons of search results.

IV. Conclusion

This chapter has argued that trade secrets and trade secret law can serve a structural function in the organization of groups, practices, and firms in the knowledge economy. Central to this structural role is the dual nature of a trade secret, as hidden from view on one side but as necessarily open on the other. The flexibility inherent in each of the several doctrinal elements that comprise a claim of misappropriation of trade secrets allow parties and courts to use the law to construct and manage what is secret, and what is open, as part of that structural role. A trade secret is never inherently secret or open. The secrecy and openness of the secret depends on how the secret is embedded in relationships among secrets and among those who develop or use the secret information.⁵⁸ To illustrate the point, the chapter reviews a series of examples of knowledge commons and explores the various roles played by trade secret law in each of them.

Like firms, markets, social norms and informal rules, commons are neither inherently productive nor inherently efficient. Like each of those things, commons offer the prospect of distinctly valuable forms of social ordering as platforms for novel and collaborative uses of knowledge, but also offer risks of socially stifling, anticompetitive, and inefficient outcomes. The fact that trade secrets can be used to construct and protect commons does not mean that their structural role always promotes social welfare.

⁵⁵ See Oren Bracha and Frank Pasquale, *Federal Search Commission? Access, Fairness, and Accountability in the Law of Search*, 93 CORNELL L. REV. 1149 (2008).

⁵⁶ See *id.* 1201-7 (2008).

⁵⁷ In the closely related case of allocation of telecommunications spectrum, a knowledge commons that historically has been tightly regulated under arguably transparent government regulation, some critics now argue that technological secrecy (encryption technology) is a viable tool for managing possible electromagnetic interference. See, e.g., Susan P. Crawford, *The Radio and the Internet*, 23 BERKELEY TECH. L.J. 933 (2008).

The availability of secrecy thus justifies far broader deregulation of private firms that supply commons resources than law or incumbent industry has been willing to accept.

⁵⁸ Cf. Michael J. Madison, *Complexity and Copyright in Contradiction*, 18 CARDOZO ARTS & ENT. L.J. 125, 154 n.107 (2000) (noting that normatively attractive “open,” heterogeneous urban communities like Berkeley and Greenwich Village may depend on their proximity to comparatively “closed,” homogeneous communities – much of San Francisco and New York). Secret status depends on its contrast with openness.

While an analysis of the structural role of trade secrets is far from complete, this preliminary review does suggest some implications.

The first implication is that a conception of trade secret law that relies exclusively or primarily on a single policy objective is likely to be underinclusive with respect to the possibly welfare-enhancing roles that trade secrets may play in the economy and society. Whether that single metric focuses on innovation incentives, commercial morality or unfair competition, there is a risk that the law might concern itself too much solely with private, bilateral interests and pay insufficient attention to collective or social institutions that offer the possibility of welfare gains by third parties, i.e., spillovers.

The second and broader implication is linked to the possibility offered previously by others, including Burk, that intellectual property rights in addition to trade secrets may serve structural or social functions that relate indirectly, if at all, to their purpose in promoting innovation and creativity.⁵⁹ Further investigation is necessary to understand what might be called the structural mechanics of intellectual property, including the relative strengths and weaknesses of all forms of intellectual property rights as structural devices, and the relative significance of intellectual property rights and other structural elements. Further investigation is also necessary to better understand the impact of specific elements of IP doctrines in constructing and managing the resources and boundaries that are essential to IP institutions, especially commons. Some commons related to trade secrets are connected to formal trade secrets doctrines; some are connected to secrecy norms. Compared to copyrights and patents, trade secrets are comparatively unfixed. Thus, as secret status evolves, both in practice and in response to legal doctrine, how do commons dynamics change?

A third and final broad implication is that given the possibility that a given commons or other institution might develop around information resources other than secrets, knowledge commons that do form around trade secrets depend not only on trade secrets rights alone and the norms and technologies to which they relate. Knowledge commons constructed by French chefs, magicians, bioscientists, and Google engineers depend not only on their respective secrets. They depend as well on normative evaluations of magic-based entertainment, French food, synthetic biology and access to online information. The further investigation suggested by this chapter is both narrow, in the sense that further case studies that focus on specific intellectual property rights are warranted, and broad, in the sense that legal entitlements alone cannot be the sole focus of study.

⁵⁹ See Burk, *supra* note 10. See also Stephen R. Munzer, *Commons, Anticommons, and Community in Biotechnological Assets*, 10 THEORETICAL INQ. L. 217, 295-7 (2009) (considering possible symbioses between open and proprietary models of innovation in synthetic biology).