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PERIPHERAL DISCLOSURE

Jason Rantanen

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ARTICLES

PERIPHERAL DISCLOSURE

Jason Rantanen*

The requirement that inventors disclose their inventions in return for a patent is a primary justification for the patent system. Yet that justification has been subject to substantial criticism. The conventional disclosure story rests on the inventor's disclosure within the patent itself, a document that arguably fails to provide meaningful information to the public and future inventors. As a result, conventional disclosure theory has largely been relegated to the category of a straw man that scholars address perfunctorily when criticizing the patent system.

This article rejects the idea that patents serve little to no disclosure function, not by demonstrating that patents themselves convey useful information, but by pointing to other disclosures of information that would not occur in the absence of a patent system, a concept that I call "peripheral disclosure." Examples of such disclosures are pervasive: inventor-employees who are only allowed to publish about ongoing research after patent protection has been secured; marketing materials describing technical information that could not be shared in the absence of a patent; the mere existence of self-disclosing inventions, to name but a few. This article builds on these examples in an attempt to explain why inventors seek to disclose information about their inventions and why it may be difficult for them to do so in the absence of patent protection.

This theory offers several benefits. First, it provides a novel justification for the patent system that scholars have previously overlooked. A second advantage is

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that it complements the existing disclosure story, cooperating to mitigate some of the weaknesses of conventional disclosure theory. The theory also suggests several hidden implications of the recently enacted Leahy-Smith America Invents Act.

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INTRODUCTION

Information is the lifeblood of innovation. Each new discovery, each new invention, reveals previously hidden pathways for advancing science and technology. Information dictates the choices open to scientists and inventors; it identifies routes that were unsuccessfully attempted; it gives innovators the basic tools necessary to accomplish their work.[1]

Given the critical role information plays in invention, it is unsurprising that the patent system has long been justified on the ground that it encourages the disclosure[2] of information by requiring inventors to provide in the patent document, information about how their invention works.[3] As Jeanne Fromer recently commented, "[p]atent disclosure is essential . . . . [It] indirectly stimulates future innovation by revealing the invention's design so that others can use it fruitfully when the patent term expires and design around, improve upon, or be inspired by the invention, even during the patent term."[4] This view is echoed by scholars who believe in the importance of the disclosure function of the patent system, a concept often referred to as disclosure theory.[5] Nor is it of concern only to academics: the

[1] The fundamental role information plays in the innovation process is largely undisputed. Meaningful technological advancement simply cannot occur in its absence. The concept of building upon the work of others is traditionally captured by the image of standing on the shoulders of giants, a metaphor used most famously by Isaac Newton. This primacy of information in the innovation process holds notwithstanding suggestions that the most significant innovations may be conceived of by newcomers to a given field. *See* THOMAS S. KUHN, THE STRUCTURE OF SCIENTIFIC REVOLUTIONS 89–90 (1962). Without the necessary conceptual tools and pre-existing scientific frameworks, such pioneers would themselves be unable to produce their revolutionary concepts.

[2] I distinguish between the *disclosure* of information and the *dissemination* of information. The former refers to information that the inventor provides to the public, including other inventors. It represents the inventor's own contribution to technological progress. I use information *dissemination* to refer to the spread of information once disclosed. The inventor who teaches another how to practice a new technology is an example of the former; the student who in turn teaches another how to practice the technology is an example of the latter. The distinction is important because while some rules may encourage information *disclosure*, they may also affect its dissemination, an issue I touch on in Part III.F.

[3] The two traditionally advanced justifications for the patent system are disclosure theory and incentive theory. This article focuses primarily on disclosure theory. For a discussion of the various theories of the patent system, see, for example, Mark A. Lemley, *The Myth of the Sole Inventor*, 110 MICH. L. REV. 709, 736–49 (2012).

[4] Jeanne C. Fromer, *Patent Disclosure*, 94 IOWA L. REV. 539, 541 (2009).

[5] In addition to Professor Fromer, scholarship in support of the value of patent disclosure includes: Dan L. Burk, *The Role of Patent Law in Knowledge Codification*, 23 BERKELEY TECH. L.J. 1009 (2008); Lisa Larrimore Ouellette, *Do Patents Disclose Useful Information?*, 25 HARV. J.L. & TECH. 531(2012); Sean B. Seymore, *The Teaching Function of Patents*, 85 NOTRE DAME L. REV. 621, 627 (2010);

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disclosure requirement of patents is commonly cited by courts as a justification for the patent system.[6]

This conventional disclosure story is based on the information contained within the patent document itself.[7] That information is part of the quid-pro-quo exchange with inventors: in return for the exclusive right to practice their invention, inventors must describe that invention in the patent and explain how it is made and used.[8] Theoretically, this disclosure ensures that anyone may create the invention once the patent has expired, and permits future inventors to design around or build upon the invention during the patent term.[9]

Theoretically, that is. In practice, patent disclosures are perhaps not so beneficial. Criticisms abound.[10] Critics contend that the disclosures are often

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Margaret McInerney, Note, *Tacit Knowledge Transfer with Patent Law: Exploring Clean Technology Transfers*, 21 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 449 (2011). Others discussing disclosure theory take a more neutral approach while still recognizing the potential value of patent disclosure. *See* Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017, 1028–30 (1989); Note, *The Disclosure Function of the Patent System (Or Lack Thereof)*, 118 HARV. L. REV. 2007 (2005).

[6] *See, e.g.*, Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470, 480–81 (1974) ("In return for the right of exclusion—this 'reward for inventions,'—the patent laws impose upon the inventor a requirement of disclosure. To insure adequate and full disclosure so that upon the expiration of the 17-year period 'the knowledge of the invention ensures to the people, who are thus enabled without restriction to practice it and profit by its use,' the patent laws require that the patent application shall include a full and clear description of the invention and 'of the manner and process of making and using it' so that any person skilled in the art may make and use the invention.") (citations omitted). Disclosure is also a common justification for the patent system discussed in blue-ribbon commission reports. *See, e.g.*, PRESIDENT'S COMMISSION ON THE PATENT SYSTEM, TO PROMOTE THE PROGRESS OF USEFUL ARTS IN AN AGE OF EXPLODING TECHNOLOGY 10–11 (1966) (identifying one of the purposes of the patent system as enabling early public disclosure of new technology to reduce duplication of efforts); FED. TRADE COMM'N, TO PROMOTE INNOVATION: THE PROPER BALANCE OF COMPETITION AND PATENT LAW AND POLICY 4–7 (2003), *available at* http://www.ftc.gov/os/2003/10/innovationrpt.pdf (same).

[7] *See generally* scholarship cited *supra* note 5.

[8] *See, e.g.*, Pfaff v. Wells Elecs., Inc., 525 U.S. 55, 63 (1998) ("[T]he patent system represents a carefully crafted bargain that encourages both the creation and the public disclosure of new and useful advances in technology, in return for an exclusive monopoly for a limited period of time."); Fromer, *supra* note 4, at 548.

[9] Fromer, *supra* note 4, at 548–49.

[10] *See, e.g.*, J. Jonas Anderson, *Secret Inventions*, 26 BERKLEY TECH. L.J. 917, 940–46 (2011); Alan Devlin, *The Misunderstood Function of Disclosure in Patent Law*, 23 HARV. J.L. & TECH. 401, 410–11 (2010); Timothy R. Holbrook, *Possession in Patent Law*, 59 SMU L. REV. 123 (2006); Lemley, *supra* note 3, at 745–47; Katherine J. Strandburg, *What Does the Public Get? Experimental Use and the Patent Bargain*, 2004 WIS. L. REV. 81 (2004); Note, *supra* note 5, at 2014–26. It is worth noting that while I acknowledge the existence of these criticisms, and this article is one response to them, I do not

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largely useless from a technical perspective, as applicants have an incentive to provide information that meets the minimum thresholds of patentability—but no more.[11] Added to this is the tendency of patent disclosures to be incomplete and opaque.[12] Applicants may disclose information about some aspects of their invention, but elect to maintain others as secrets.[13] These weaknesses are further compounded by the structure of a patent system that, through the willful infringement doctrine, actively discourages companies from reading the patents of their competitors.[14] These limitations suggest that patent law may do a poor job of effectuating the disclosure of technological information through patents.[15]

These criticisms are ultimately directed at two central precepts underlying conventional disclosure theory. First, conventional disclosure theory focuses entirely on the disclosure of the *patent*: the information contained in the document itself. Second, underlying conventional disclosure theory is the idea that patent law promotes information dissemination by *forcing* inventors to reveal the technological underpinnings of their inventions, a function it achieves through the requirements of enablement, written description, and best mode.[16]

In this article, I suggest that adherence to these two foundational precepts of conventional disclosure theory causes us to overlook an equally important role that patents play in the disclosure of technical information. Rather than thinking about the disclosure function in terms of what patents themselves reveal, we should instead focus on the role patents play in causing the disclosure of valuable technical information through other vehicles. And rather than viewing the patent system as

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necessarily consider them so persuasive as to convince me that patent disclosures are not both significant and beneficial in terms of technological progress. Indeed, as I discuss infra Part IV.B., there is a place for both conventional and peripheral disclosures in the patent system.

[11] *See* Note, *supra* note 5, at 2024–26.

[12] *See id.* at 2024–25.

[13] *See id.* at 2024.

[14] For a discussion of these criticisms, see, for example, Holbrook, *supra* note 10, at 139–43.

[15] Or as Mark Lemley recently suggested, "[t]he theory that patents are valuable for the information they disclose, then, doesn't seem to describe the real world—at least, not enough so to stand alone as a justification for having a patent system." Lemley, *supra* note 3, at 747.

[16] These requirements are laid out in 35 U.S.C. § 112 (2006). One might also add claim construction to this list, if one were to adopt Judge Lourie's view of its role as restricting patent scope based on the patent's disclosure. *See* Jason Rantanen, Crown Packaging v. Ball Metal Beverage Container*: The Problem-Solution Approach to Written Description Issues*, PATENTLY-O (Apr. 12, 2011), http://www.patentlyo.com/patent/2011/04/crown-packaging-v-ball-metal-beverage-container-the-problem-solution-approach-to-written-description.html.

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needing to *force* disclosure, we should instead recognize that many inventors *want* to share information about their inventions and the patent system facilitates this in ways that would not be possible in its absence.[17] These two elements suggest that patents may have played—and still may play—a greater role in technological advancement than previously recognized.

This article builds on these two insights to develop a theory of *peripheral disclosure*, a term that I use to refer to the disclosure of information that would not occur in the absence of a patent system.[18] Examples of such disclosures are pervasive: inventor-employees who are only allowed to publish about ongoing research after patent protection has been secured; marketing materials describing technical information that could not be shared in the absence of a patent; the mere existence of self-disclosing inventions—inventions whose technological

[17] In proposing the idea of peripheral disclosure, I recognize that not all inventors will have an incentive to share information about their inventions, an issue I address infra Parts II and III.

[18] No prior author has ever developed the concept I refer to as peripheral disclosure in any depth. Although the broad idea of patents as facilitating (rather than forcing) information disclosure is one that is frequently mentioned in articles and texts, only a sentence or two is devoted to the idea without any source citation. *See, e.g.*, WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW 328 (2003) ("In the absence of a patent option, inventors would invest many more resources in maintaining trade secrecy (and competitors in unmasking them) and inventive activity would be inefficiently biased toward inventions that can be kept secret."); CRAIG ALLEN NARD & R. POLK WAGNER, PATENT LAW 2 (2008) (noting that patents may reduce the incentive to hide information); John M. Golden, *Principles for Patent Remedies*, 88 TEX. L. REV. 505, 522 (2010) (commenting that the absence of patent rights might cause scientists, engineers, and their employers to fail to make many currently routine disclosures such as through trade shows and conventions, promotional materials and manuals). The concept of peripheral disclosures might be considered a form of patent spillover. *See* Brett M. Frischmann & Mark Lemley, *Spillovers*, 107 COLUM. L. REV. 257 (2007). Although, even in that context, the idea of information spillovers resulting from patents is heavily under-theorized. The most extensive discussion of which I am aware is by Mark Lemley in his recent article *The Myth of the Sole Inventor*, in which he briefly sketches the idea before rejecting it. Lemley, *supra* note 3, at 748–49. Timothy Holbrook likewise raises the possibility, although he limits it to pre-patent disclosures and publications. Holbrook, *supra* note 10, at 146 ("An inventor who anticipates obtaining a patent on an invention will be more willing to publish a scientific article or other sort of disclosure to the public, because she knows her invention will eventually be protected by a patent and not by a trade secret."). A few other commentators mention similar ideas, although no one has analyzed the issue in any depth. In his conclusion, for example, a student suggests that patents may allow "inventors to discuss and publicize their research freely." Note, *supra* note 5, at 2027. *See also* Anderson, *supra* note 10, at 929 (making a similar comment and citing Note, *supra* note 5). There is at least one specific behavior that could fall within the scope of "peripheral disclosure" that has been heavily theorized already, that being the role patents play in facilitating licensing transactions involving technical know-how, a concept I discuss infra Part III.E.

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underpinnings can be easily perceived or reverse engineered once placed in the stream of commerce[19]—to name but a few.

This theory offers several benefits. First, it provides a novel justification for the patent system that scholars have previously overlooked. Scholars have long debated the fundamental question of whether the existence of the patent system is justified.[20] Traditionally, to the extent that this scholarship addresses disclosure, it does so only in the form of conventional disclosure theory.[21] Peripheral disclosure theory offers a response to this critique of the patent system, and suggests that a system that encourages secrecy may have a detrimental effect on invention and innovation. Indeed, the idea of peripheral disclosure suggests that rather than failing, the patent system as a whole is providing significant informational benefits that cannot be identified simply by looking at the content of the patent document itself. Along similar lines, peripheral disclosure also complements the existing disclosure story, mitigating some of the weaknesses of conventional disclosure theory.

The theory also suggests several hidden implications of the recently enacted Leahy-Smith America Invents Act (AIA).[22] Much of the conversation among

[19] The term "self-disclosing inventions" was coined by Katherine Strandburg to describe inventions that are easily copied from their commercial embodiments. *See* Strandburg, *supra* note 10, at 83. All inventions fall on a spectrum, of course, with some falling far towards the self-disclosing or non-self-disclosing ends of the spectrum.

[20] The literature relating to this debate could fill an entire article by itself. Significant examples include Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, *in* NAT'L BUREAU OF ECON. RESEARCH, THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS 609, 615 (1962), *available at* http://www.nber.org/chapters/c2144; LANDES & POSNER, *supra* note 18; Kenneth W. Dam, *The Economic Underpinnings of Patent Law*, 23 J. LEGAL STUD. 247 (1994); Eisenberg, *supra* note 5; Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265, 276 (1977); and Lemley, *supra* note 3. Of these, Arrow comes the closest to a substantive exploration of the concept of peripheral disclosure, but even his analysis focuses only on the ability of patents to facilitate licensing transactions involving exchanges of technological knowledge, as opposed to the broader concept of peripheral disclosure presented here.

[21] In addition to the foundational literature *supra* note 20, more recent participants in this debate focus almost exclusively on conventional disclosure theory. *See, e.g.*, Anderson, *supra* note 10, at 919–20. Recent broad-based attacks on the patents system also fail to account for peripheral disclosure. *See generally* JAMES BESSEN & MICHAEL J. MEURER, PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK (2008); MICHELE BOLDRIN & DAVID K. LEVINE, AGAINST INTELLECTUAL MONOPOLY (2008) (proposing the abolition of patent "monopolies" and viewing the disclosure function of patents as having little value, but not considering the peripheral disclosure effects of patents); ADAM B. JAFFE & JOSH LERNER, INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS AND WHAT TO DO ABOUT IT (2004).

[22] Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011).

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politicians, lawyers, and scholars both before and after passage of the AIA has focused on the effects that the new patents laws will have on the incentive to invent and the effects on competition.[23] Yet, as I discuss in Part V, the AIA is also likely to affect the degree to which inventors may be willing to engage in peripheral disclosures of their inventions.

The remainder of this article will expand upon these ideas. Part I describes the current state of conventional disclosure theory as viewed by both its proponents and critics. Part II presents the concept of peripheral disclosure, explaining why and how it functions. Part III provides several examples of peripheral disclosure in practice, revealing nuances of the theory; and Part IV explores implications of peripheral disclosure.

I. THE LIMITATIONS OF CONVENTIONAL DISCLOSURE THEORY

If people are the organs of invention, information is its lifeblood. Without the sharing of information, we would be forced to constantly reinvent fire, sitting in our caves staring blankly at sticks. It stands to reason, then, that encouraging inventors to explain their inventions to the public promotes further technological development.

A. Conventional Disclosure Theory

Courts and scholars typically offer two primary invention-related justifications for the patent system: it provides an incentive to invent and it offers an incentive for inventors to disclose the technological underpinnings of their inventions to the public.[24] The former justification revolves around the probabilistic

[23] Discussion relating to the issue of disclosure has largely focused on the impact of the effective elimination of the best mode requirement. *See* Ryan Vacca, *Patent Reform and Best Mode: A Signal to the Patent Office or a Step Toward Elimination*, 75 ALB. L. REV. 279, 293–95 (2012) (suggesting that the "best mode" requirement has been rendered toothless and applicants may actively conceal the best mode if the chance that the PTO catches the omission are low); Bron D'Angelo, *The America Invents Act: What Remains of Best Mode*, GORDON & REES LLP NEWSLETTER (Nov. 2011), http://www.gordonrees.com/documents/IPNewsletter-Nov2011-BestMode.pdf (suggesting applicants may opt to disclose only so much of the "best mode" to satisfy the individual examiner, potentially preventing the public from knowing how the invention is best carried out).

[24] *See, e.g.*, Eldred v. Ashcroft, 537 U.S. 186, 226–27 (2003) (Stevens, J., dissenting); Pfaff v. Wells Elecs., Inc., 525 U.S. 55, 63 (1998) ("[T]he patent system represents a carefully crafted bargain that encourages both the creation and the public disclosure of new and useful advances in technology, in return for an exclusive monopoly for a limited period of time."). *See also* Note, *supra* note 5, at 2011–13. These two justifications are not exclusive. Examples of alternate theories include commercialization theory, which relates primarily to the commercialization of new inventions as opposed to their creation, and Mark Lemley's recently developed patent race theory. *See* Lemley, *supra* note 3, at 736–59.

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reward that the patent system offers to those who invest resources towards invention.[25] The basic idea is that producing entities, be they people or firms, have a finite amount of resources.[26] They may choose to invest those resources in any of a number of ways, one being towards technological developments.[27] The patent system encourages investment in technological development by giving the investor who first successfully develops a new product or method the possibility of obtaining exclusive rights over that invention, allowing the inventor to charge a supra-competitive price during the patent's life.[28] Thus, the theoretical explanation underlying the incentive to invent justification is that granting successful inventors a market-based financial reward spurs investment in research and development of new inventions. According to this theory, these new inventions would likely never have been created but for the existence of the patent system, or at least would have come into being at a much later time.[29]

A second oft-recited justification for the patent system, and one more central to this Article, is that it encourages the disclosure of new technologies.[30] No one seriously disputes the important role that dissemination of technological

[25] There is extensive scholarly literature built around the theory that the patent system promotes technological advancement by incentivizing inventors to invent. *See, e.g.*, Lemley, *supra* note 3, at 736–38. As with disclosure theory, scholars have raised any number of criticisms of the incentive to invent theory. *See id.*

[26] Examples of such resources include money, time, and materials.

[27] It is largely undisputed that greater investment in research and development leads to more new inventions. *See* Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 878 (1990). I note in passing Schumpeter's distinction between invention and innovation, *see* Eisenberg, *supra* note 5, at 1039–40 (discussing Schumpeter's distinction between invention, used to refer to post-invention development of new commercial goods, products, markets, etc., and innovation). Both invention and innovation, in my mind, are captured within the broad category of the creation of new technologies, and can be the subject of peripheral disclosures. For the most part, the precise delineation of technological development into invention and innovation is unnecessary for this Article; rather, it is the underlying activities that I focus on in applying the theory in Part IV.

[28] *See, e.g.*, Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470, 480 (1974) ("The patent laws promote this progress by offering a right of exclusion for a limited period as an incentive to inventors to risk the often enormous costs in terms of time, research, and development.").

[29] The incentive justification is also commonly described in public goods terms, with the patent system offering a solution to the public goods problem associated with the creation of inventions, which are non-rivalrous, non-excludable goods. For a fuller description of the public goods approach, see, for example, Anderson, *supra* note 10, at 924–25.

[30] *See* Pfaff v. Wells Elecs., Inc., 525 U.S. 55, 63 (1998); *Kewanee*, 416 U.S. at 480 ("In return for the right of exclusion—this 'reward for inventions,'—the patent laws impose upon the inventor a requirement of disclosure.") (citation omitted); Anderson, *supra* note 10, at 923–24.

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information plays in invention.[31] Hence, requiring inventors to disclose information about their inventions in order to obtain a patent confers a significant social benefit on the public.[32]

The primary vehicle for disclosure of invention information under conventional theory is the patent document itself.[33] It is through the patent that the inventor must reveal the invention for all to see.[34] This emphasis on the patent document is congruent with the view of disclosure theory as involving a bargain with the public: the inventor provides information about the invention and receives, in return, the exclusive right to practice that invention for a limited period of time.[35]

Under this view, the patent system performs its disclosure function by requiring inventors to comply with three legal requirements: written description, enablement, and best mode, codified in 35 U.S.C. § 112.[36] Written description requires the inventor to describe the invention in a manner adequate to convey possession of the invention to a person having ordinary skill in the art as of the time that the patent application was filed.[37] Enablement requires the inventor not just to describe the invention, but also to explain how it is made and used.[38] In other words, provided that a patent satisfies the enablement requirement, a person having ordinary skill in the art should be able to practice the invention using the information provided by the inventor in the patent.[39] Best mode requires an inventor to disclose what the inventor subjectively believes is the best method of

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[31] *See, e.g.*, *supra* note 1; Anderson, *supra* note 10.

[32] These two social benefits, of new inventions and information about those new inventions, are not obtained without cost to the public. Patent rights extract a social cost in terms of the deadweight loss caused by monopolistic pricing. *See* Anderson, *supra* note 10, at 929–30.

[33] The primacy of the patent document to conventional disclosure theory is central to both proponents of conventional disclosure theory. *Compare* Fromer, *supra* note 4, at 554 (representing the proponents), *with* Holbrook, *supra* note 10, at 131–32 (representing the critics).

[34] Patent law requires disclosure through the legal doctrines of enablement, written description, and best mode. *See* Holbrook, *supra* note 10, at 126.

[35] *Id.* at 131.

[36] *Id.* at 127–31.

[37] 35 U.S.C. § 112 para. 1 (2006). Note that the paragraph numbering is by convention; the paragraphs of § 112 are not numbered in the text.

[38] *Id.* para. 2.

[39] Holbrook, *supra* note 10, at 128. While some level of experimentation may be required of the hypothetical person of skill in the art, it must not be undue. *Id.* at 129.

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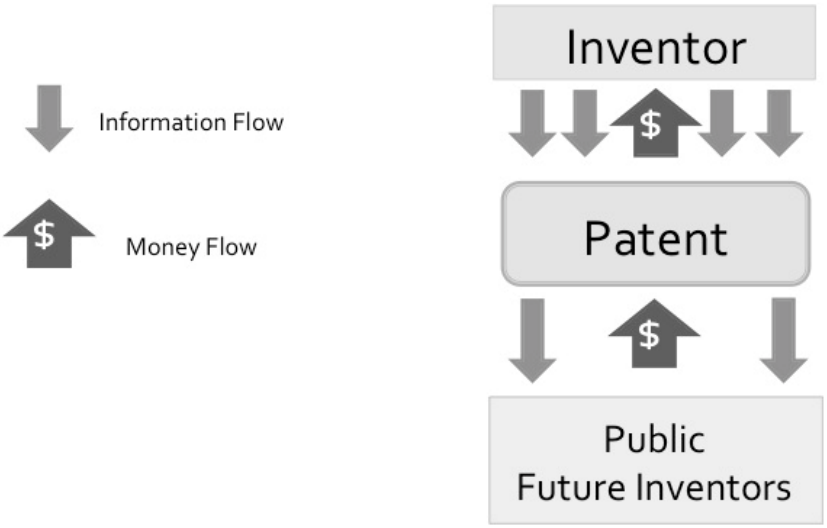
practicing the invention.[40] From a conventional disclosure standpoint, this requirement prevents patentees from engaging in a combination secrecy-patent approach to the invention, disclosing inferior methods of using the invention to the public while maintaining the best method as a secret.[41] All three of these requirements necessarily involve disclosures in the patent document itself.[42]

The diagram below illustrates the concept of conventional disclosure theory.

Figure 1: Conventional Disclosure Theory



In theory, these three requirements should cause patents to teach technological information about new inventions to the public. Patent law lays out the types of information that must be taught: a description of the invention, how it is made and used, and the best way to practice the invention. Disclosure of this information in the patent document is not permissive; it is mandatory. Inventors *must* teach this information to the public if they desire a patent, or so goes conventional theory.

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[40] 35 U.S.C. § 112 para. 3 (2006).

[41] Holbrook, *supra* note 10, at 130. *See also* Lee Petherbridge & Jason A. Rantanen, *In Memoriam Best Mode*, 64 STAN. L. REV. Online 125 (2012), http://www.stanfordlawreview.org/online/in-memoriam-best-mode (providing an alternative theoretical explanation of the importance of the best mode requirement).

[42] 35 U.S.C. § 112 (2006) (describing the requirements of the patent specification).

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B. Criticisms of Conventional Disclosure Theory

There are several reasons to question the efficacy of the disclosure function of patents, however. These criticisms largely fall into two categories: the lack of useful information within the patent document itself and the unwillingness of other inventors to consult patent documents in order to obtain technical know-how. Perhaps most surprising is that these criticisms are widely accepted both by critics of conventional disclosure theory as well as its proponents.

1. Patents Do Not Convey Useful Technological Information

Even among many proponents of conventional disclosure theory, there is a belief that, at least under as under current law, patents fail to adequately convey useful technological information.[43] Patents often do not contain key pieces of information, fail to transfer tacit knowledge,[44] and may be virtually incomprehensible, even to those of skill in the art.[45]

The problem lies in the limited ability of patent law to *force* inventors to disclose meaningful information in the patent document. As the law is presently applied, inventors are able to disclose just enough to meet the minimum threshold for a patent allowance while holding back crucial bits of technical information necessary to efficiently practice the invention.[46] Patents may also contain old information; applications are not published until a year and a half after filing, and may have been drafted substantially earlier.[47] Thus, they are unlikely to reflect the current state of the art.[48] Furthermore, because patents are typically drafted by lawyers whose job is to maximize the scope and strength of the inventor's legal

[43] *See* Fromer, *supra* note 4, at 560–62; Note, *supra* note 5, at 2024–25. *But see* Ouellette, *supra* note 5, at 551. This consensus is shared with critics of conventional disclosure theory. *See* Anderson, *supra* note 10; Holbrook, *supra* note 10, at 131.

[44] For a discussion of the ways in which patents fail to transfer tacit knowledge (equipment know-how and worker expertise), see McInerney, *supra* note 5, at 481.

[45] Note, *supra* note 5, at 2024–25.

[46] *Id.*

[47] *See* 35 U.S.C. § 122 (2006) (requiring that most applications be published 18 months after filing). Applicants may be able to effectively extend the time their application is kept secret through the use of a provisional application. *See* Dennis D. Crouch, *Is Novelty Obsolete? Chronicling the Irrelevance of the Invention Date in U.S. Patent Law*, 16 MICH. TELECOMM. & TECH. L. REV. 53 (2009).

[48] Holbrook, *supra* note 10, at 143 (stating that "[e]ven absent the willful infringement doctrine, the reality is that disclosures in patents are not timely due to delays in the publication of the patent and also often due to the patent applicant's delays.").

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right, not to maximize the dissemination of information, useful technical information is difficult to access through the patent document.[49] Attorneys may include numerous meaningless examples for the purpose of maximizing claim scope; these examples may provide no substantive technical information.[50] Thus, even when useful technical knowledge is disclosed, it is often buried within extraneous information included to prevent courts from narrowing the scope of the patent right.[51] Taken together, these problems lead to criticisms of patents being ineffectual teachers of new technologies.[52] These criticisms[53] have real teeth, and are illustrated in Congress' recent effective elimination of the best mode requirement through the recently-enacted AIA.[54]

2. Inventors Do Not Consult Patents to Obtain Technical Know-How

Not only do patents fail to effectively provide information, their prospective audience is perhaps an unwilling one that rarely looks to them for technical know-how. One of the main critics of conventional disclosure theory, Timothy Holbrook, has identified several reasons to suspect that inventors are unlikely to seek out patents for their technical information.[55] Foremost among them is the lack of an experimental use exception to patent infringement; follow-on inventors cannot practice an invention without infringing the patent, even for the mere purposes of

[49] *See* Timothy Holbrook, *Patents, Presumptions, and Public Notice*, 86 IND. L.J. 779, 786 (2011) (describing patents as a "somewhat bizarre mix of the technical and legal").

[50] Note, *supra* note 5, at 2025.

[51] *Id.*

[52] Holbrook, *supra* note 10, at 146.

[53] Criticisms of the best mode requirement were common in the decade leading up to the AIA. *See id.* at 130 n.37 (citing NAT'L RESEARCH COUNCIL, A PATENT SYSTEM FOR THE 21ST CENTURY 36, 120–21 (Stephen A. Merrill et al. eds., 2004). *But see* Jerry R. Selinger, *In Defense of "Best Mode": Preserving the Benefit of the Bargain for the Public*, 43 CATH. U. L. REV. 1071, 1071–72, 1096–97 (1994)); Petherbridge & Rantanen, *supra* note 41.

[54] The America Invents Act effectively terminated the best mode requirement by eliminating virtually all of the consequences of failing to disclose the best mode. *See* Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011); Petherbridge & Rantanen, *supra* note 41; Lee Petherbridge & Jason A. Rantanen, *The Pseudo-Elimination of Best Mode: Worst Possible Choice?*, 59 UCLA L. REV. DISC. 170.

[55] Holbrook, *supra* note 10, at 139.

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studying how it functions in order to build improvements.[56] Of perhaps equal force is the risk of willful infringement, under which a person who deliberately copies a patented invention can be subject to treble damages for infringing the patent.[57] Given the problems associated with relying on the technical disclosure of a patent, Holbrook argues, follow-on innovators have little incentive to do so. This idea has broad consensus and commentators largely agree that prospective inventors rarely look to patents for technical information.[58]

As with conventional disclosure theory itself, both categories of criticism focus on the patent document: what it conveys and whether it is read. They also largely target the inability of current law to force inventors to disclose technical information about their invention in the patent. Scholars assume that inventors are unwilling teachers who cannot and will not provide useful information in the patent document.[59] This is not to say that patents are useless in terms of disclosure; they may play a crucial role in the codification of knowledge, for example.[60] But overall, the literature is replete with reasons to question whether patents themselves disclose new technologies, and critics of the patent system have leaped at that suggestion.[61]

Yet, the disclosure story need not end there. The next section develops a new narrative thread—that disclosure of technical information about new inventions occurs outside the confines of the patent document and that inventors do not need to be *forced* to disclose information about their inventions; they instead need to be *freed* to do so. It is this alternative approach to disclosure that I explore in greater detail in the remainder of this article.

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[56] *Id.* Holbrook also points out that there is an extremely narrow right of experimental use, but it is so constrained as to be practically nonexistent. *Id.*; *see also* Eisenberg, *supra* note 5 (offering suggestions for the proper scope of an experimental use exception).

[57] Holbrook, *supra* note 10, at 142. One wonders how serious the risk of willful infringement is post-*Seagate*, however. *In re* Seagate Technology, LLC, 497 F.3d 1360 (Fed. Cir. 2007); *see* Jason A. Rantanen, *An Objective View of Fault in Patent Infringement*, 60 AM. U. L. REV. 1575, 1629–31 (2011) (arguing that the standard for willful infringement is extremely high post-*Seagate*).

[58] *See* Anderson, *supra* note 10, at 941; *see also* Fromer, *supra* note 4, at 560 (agreeing with the view that inventors rarely spend time reading others' patents). *But see* Ouellette, *supra* note 5 (offering data suggesting that inventors in at least one field do look at patents for their technical teachings).

[59] *See, e.g.*, Anderson, *supra* note 10, at 944 (Explaining that "[p]atentees can avoid fully disclosing their inventions via a number of methods.').

[60] For a detailed discussion of the role patents play in codifying knowledge, *see generally* Burk, *supra* note 5.

[61] *See* sources cited *supra* note 10.

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II. A THEORY OF PERIPHERAL DISCLOSURE

As discussed in the preceding section, there is a strong argument that conventional disclosure theory does not, by itself, provide a particularly good justification for the patent system. Scholars have repeatedly attempted to stomp disclosure theory into the ground, and even its staunchest defenders rally only in the context of proposing changes to improve the quality of information provided by the patent document.[62] These criticisms flow from two basic precepts on which the conventional view of disclosure is built: first, conventional disclosure centers on the patent document as the mechanism of disclosure, and second, it relies on the premise that the patent system promotes disclosure by *forcing* inventors to reveal the secrets of their inventions.

This section explains why our understanding of the disclosure function of patents should not be so narrow. Rather than viewing the patent as the vehicle of information dissemination, we need to recognize inventors do provide information in other ways than through patents, and that inventors might not provide information in these ways but for the existence of patents. Instead of looking at the patent system as *forcing* disclosure, we must recognize that patents *free* inventors to share information while retaining the ability to monetize the invention. These two elements form the basis of the theory of peripheral disclosure.

Peripheral disclosure is the non-patent sharing of information by an inventor that would not occur in the absence of a patent system. In other words, it is information that is being provided by an inventor in a form other than the patent document. Peripheral disclosure does not refer to all information freely shared, however. It refers to information that an inventor could not share with the public without losing some ability to monetize[63] the invention under a regime relying on secrecy to appropriate the value of an invention.[64] The following graphic concisely

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[62] *See* sources cited *supra* note 5.

[63] By "monetize the invention" or "appropriate the value of the invention," I simply mean the ability to engage in supra-competitive pricing of embodiments of the invention (i.e., the ability to charge a premium on goods due to the presence of the invention) or the ability to engage in licensing transactions for the underlying technology of the invention.

[64] It bears noting that not all inventors seek to directly monetize their inventions. Non-monetary factors may provide a powerful motivation for some inventors to invent. Katherine J. Strandburg, for instance, argues that user innovators may not just develop and use their own inventions—without seeking financial gain from exclusionary practices—but are also willing to freely reveal their inventions to others. *See* Katherine J. Strandburg, *Users as Innovators: Implications for Patent Doctrine*, 79 U. COLO. L. REV. 467, 474–81 (2008). But while I agree with Professor Strandburg that non-pecuniary motivations to invent may be a significant force, in many instances investment in technological development is driven largely by the goal of financial reward.

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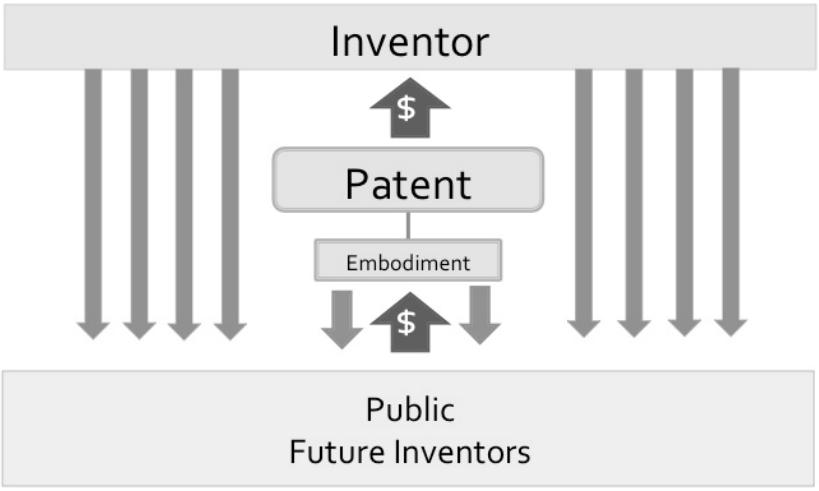
expresses the concept of peripheral disclosure, with the lighter gray arrows illustrating the flow of information from both the inventor and the embodiment of the invention.

Figure 2: Peripheral Disclosure



A hypothetical exercise best illustrates the concept of peripheral disclosure. Envision a world without patents.[65] In this world, the only mechanism an inventor possesses for monetizing an invention is secrecy.[66] Invention will likely continue to

[65] This need not be a purely hypothetical exercise. The world of pre-patent Europe provides a rich example. One need look no further than the culture of secrecy among engineers and architects, in which information was rarely recorded and inventions were rarely shared—until a patent system came along, of course. For a detailed history of innovation and secrecy during this period, *see generally* WILLIAM EAMON, SCIENCE AND THE SECRETS OF NATURE: BOOKS OF SECRETS IN MEDIEVAL AND EARLY MODERN CULTURE (1996); PAMELA O. LONG, OPENNESS, SECRECY, AUTHORSHIP: TECHNICAL ARTS AND THE CULTURE OF KNOWLEDGE FROM ANTIQUITY TO THE RENAISSANCE (2001).

[66] It does not matter whether or not this is a pure secrecy regime or a trade secrecy regime—in both systems, the goal is to avoid sharing of information in order to monetize the invention, and thus disclosure is antithetical to successful appropriation. Contracts might alleviate some issues of secrecy, especially the use of nondisclosure agreements, but these mechanisms are limited in terms of their effectiveness, *see infra* Part III.E, and ultimately are based on the concept of preventing the contracting parties from freely sharing information about the invention, viz., secrecy.

One alternative mechanism for promoting invention that does not rely on secrecy is that of a prize system. *See, e.g.*, Michael Abramowicz, *Perfecting Patent Prizes*, 56 VAND. L. REV. 115 (2003) (discussing prize systems in detail). Yet there are weaknesses and limitations of a prize system that suggest that it is probably not an optimal mechanism for promoting most types of inventions that will directly interest consumers. *See* Devlin, *supra* note 10, at 416.

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occur—a secrecy regime still provides an incentive for prospective inventors to invest resources directed towards at least some forms of invention.[67] But inventors cannot share information about how their inventions work without giving away some or all capturable monetary value, viz., their ability to appropriate at least enough of the incremental value of the invention to justify the investment.[68] If an inventor of a new chemical process wishes to share information about that process with the world, that inventor would lose the ability to exclusively practice that process.[69] Inventors in this "patent-less" world are thus faced with a choice: maintain the invention in secrecy and preserve the ability to monetize it, or share it with the world, allowing others to copy it, and lose the ability to profit from its use. Copying is a very real threat—after all, it is the main reason firms give for investing in patents.[70]

[67] *See* Anderson, *supra* note 10, at 932.

[68] *See* Michael Risch, *Trade Secret Law and Information Development Incentives*, *in* THE LAW AND THEORY OF TRADE SECRECY: A HANDBOOK OF CONTEMPORARY RESEARCH 152, 155 (Rochelle C. Dreyfuss & Katherine J. Strandburg eds., 2010), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1411579) (noting that "disclosure of secret information for public use negates both secrecy and most of the value that could come from that secrecy.").

[69] Long provides the example of an explicit admonition of secrecy in a recipe for purple dye: "Keep this as a secret matter because the purple has an extremely beautiful luster," concluding that "[c]learly, the author believed that the recipe should be kept secret to protect knowledge of how to produce the remarkable color that resulted." LONG, *supra* note 65, at 65.

[70] *See* Wesley M. Cohen et al., *Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S. Manufacturing Firms Patent (Or Not)*, 17 (Nat'l Bureau of Econ. Research, Working Paper No. 7552, 2000) (reporting the results of a study indicating that for 96% of respondents, prevention of copying was a motive for patenting); Stuart J.H. Graham et al., *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey*, 24 BERKELY TECH. L.J. 1255, 1297 (2009) (reporting the results of a study indicating that the most important reason respondent startups gave for patenting was to prevent others from copying the startup's products and services).

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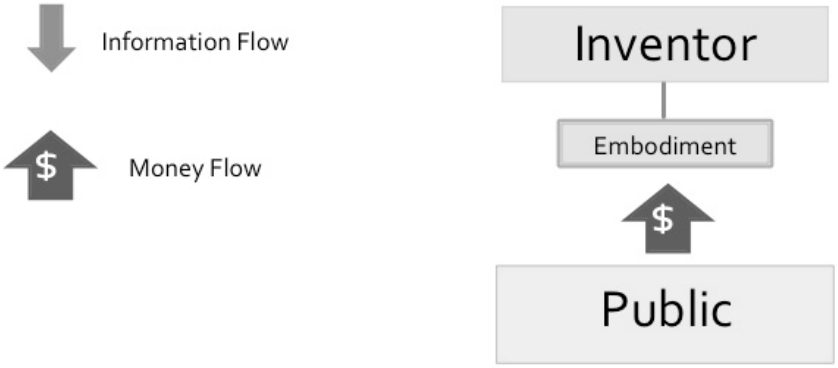
Figure 3: A World Without Patents



Introduce the ability to patent new inventions, however, and the hypothetical changes completely. Now inventors are no longer faced with the dilemma of monetize or disclose—they can do both. The chemist can extract commercial value from the new chemical process *and* disclose how it works to the world.[71] The inventor's ability to share information about an invention while preserving its monetary value is what lies at the heart of the theory of peripheral disclosure.

But why would an inventor want to disclose an invention that he or she might not otherwise need to? The idea that inventors would *willingly* reveal information about their inventions flies contrary to all conventional views on patent disclosure.[72] Inventors need to be *forced* to disclose their inventions, or so conventional theory states. I suggest, however, that contrary to conventional thought, patentees often *want* to disclose their invention. Inventors frequently do not desire to keep their invention secret, but because of the tension with commercial reality, it may be a necessity in the absence of a patent system.

There are many reasons why inventors may want to freely share information about the technological workings of their inventions. One is well theorized already: commercialization of the invention and licensing transactions often require the inventor to reveal detailed information about the technology.[73] However, there are

[71] The British chemist and industrialist Henry Perkin's development of mauve dye provides an early example of peripheral disclosure: after discovering how to create mauve dye, he both patented and published his result, while at the same time building a successful dye business around his invention. *See* Michaela M. Sousa et al., *A Study in Mauve: Unveiling Perkin's Dye in Historic Samples*, 14 CHEMISTRY EUR. J. 8507 (2008).

[72] *See* scholarship cited, *supra* notes 5 and 10.

[73] *See, e.g.*, Arrow, *supra* note 20.

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many other reasons that inventors may desire to share information about their invention with the public. Inventors may seek the reputational rewards that flow from publications. Companies may need to share information about the invention for marketing purposes. The invention itself may be self-disclosing, in that it is easy to reverse engineer. Patents allow inventors to engage in activities that involve dissemination of information about an invention without losing the ability to monetize it.[74]

In the same way that it is important to understand what peripheral disclosure is, it is equally important to understand what it is not. Not every disclosure of new technical or scientific information in a form other than a patent is a peripheral disclosure. This is particularly true when the funding of invention is driven by something other than a desire to monetize the result. As Arti Rai has discussed in the context of biotechnology, inventors and their financial supporters may invent and disclose for reasons that transcend the raw desire to monetize a new technology.[75] Disclosures made in this context are not necessarily peripheral disclosures because there is no underlying desire to monetize the technology, and thus no restrictions on disclosure could arise as a result of that desire.

Even where a desire to monetize the new technology exists, however, a disclosure may not be a consequence of the existence of a patent (or at least the possibility of obtaining a patent). If the value to the firm of disclosing the information exceeds the cost in terms of the risk that the disclosure will improve a competitor's relative position, a rational firm will disclose the information, even in the absence of a patent. This is seen in the case of product marketing discussed below.

Thus, the concept of peripheral disclosure is not unbounded; to the contrary, in some instances few disclosures may be a consequence of the existence of the patent system. And admittedly, it may be difficult to disentangle how much influence the patent possibility has on any one decision to disclose. Yet, neither of

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[74] Patents also provide a related benefit in that they eliminate the costs involved under a secrecy regime. *See* LANDES & POSNER, *supra* note 18, at 328 ("In the absence of a patent option, inventors would invest many more resources in maintaining trade secrecy . . . ."). These are additional costs that are necessary under a secrecy regime to preserve the commercial value of the technology, but that do not exist under a patent regime. Patents are not costless, of course, but in the face of potentially extreme costs to maintain secrecy, such as in the case of inventions that are on the border of the self-disclosing category, they may be the more efficient for of protection for technological innovations.

[75] Arti Kaur Rai, *Regulating Scientific Research: Intellectual Property Rights and the Norms of Science*, 94 NW. U. L. REV. 77, 89–90 (1999).

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these issues is anything new; every explanation of how the patent system promotes technological progress is subject to the same limitations.[76]

III. PERIPHERAL DISCLOSURE ALL AROUND US

Simply theorizing about the existence of peripheral disclosure does not establish its existence, of course. It is better to identify and describe some examples of peripheral disclosure in action. The following sections expand on the concept of peripheral disclosure through examples of how it functions.

A. Scientific Publications

Inventors, like legal academics, are often driven to publish. Sharing their knowledge with the world brings personal fulfillment and reputational rewards.[77] Yet inventors also often need to monetize their inventions, either because they require the income or because they are employees of firms (which generally strive to make money). The patent system allows inventors to both publish and monetize their inventions.[78]

The story of Kary Mullis, the inventor of the polymerase chain reaction (PCR), illustrates the role patents can play in allowing inventor-employees to share their discoveries with the world. In the early 1980's, the nascent biotechnology industry was faced with a fundamental problem: how to obtain the quantity of a specific fragment of DNA necessary to conduct further analysis and manipulation. Kary Mullis, a scientist at Cetus Corporation, hit upon the solution of repeatedly using DNA polymerase, an enzyme that synthesizes a new strand of DNA identical to an existing template strand, in order to create a chain reaction that would produce an exponential increase in the quantity of DNA fragments.[79] This

[76] *See* Lemley, *supra* note 3. Even Lemley's "patent race" theory of patenting has greater explanatory power in some contexts rather than others. *Id.* at 755–58.

[77] *See* Rai, *supra* note 75. In addition, William Hubbard suggests that social norms relating to invention provide a strong mechanism for encouraging inventors to invent. *See* William Hubbard, *Inventing Norms*, 44 CONN. L. REV. 369 (2011). In order for these norms to have any effect, however, inventors need some mechanism for achieving recognition. Publication is one such mechanism—one that would be less viable in absence of patents. *See id.* at 402 (commenting that "[w]ithout patent protection, however, publication might be less frequent because competitors could copy technology from such publication.").

[78] This ability comes with a caveat—under the current legal regime, such publication will probably only occur after the application has been filed. The publication could be up to a year before the filing date, given the one-year grace period of 35 U.S.C. § 102(b) (1965), but if the inventor intends to file internationally, *any* pre-filing publication could prevent the inventor from obtaining a patent.

[79] This explanation of PCR, and Mullis's contribution, is grossly oversimplified. For a slightly longer explanation of the invention of PCR, *see The History of PCR (RU 9577)*, SMITHSONIAN INST.

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amplification technique was critical to the growth of the biotechnology industry over the subsequent decades,[80] and it is now used in criminal forensic investigations, food science, ecological field studies, and diagnostic medicine to name just a few applications.[81]

Leaving aside the importance of PCR as a commercial product,[82] a significant portion of the social value of Mullis's invention lies in the information his scientific publications provided to other inventors and scientists. Even while Mullis's patents on PCR were pending, he published articles and made presentations that described the invention.[83] Mullis's subsequent use of Taq polymerase, a thermostable enzyme that simplified the PCR process, had an equally great impact, as indicated by the thousands of times the article disclosing it

ARCHIVES, http://siarchives.si.edu/research/videohistory_catalog9577.html (last visited July 2, 2012). For a detailed history and ethnographic account of the invention of PCR, *see generally* PAUL RABINOW, MAKING PCR: A STORY OF BIOTECHNOLOGY (1996).

[80] For example, more than 3% of all PubMed articles refer to PCR. *See* John M.S. Bartlett & David Stirling, *A Short History of the Polymerase Chain Reaction*, 226 METHODS IN MOLECULAR BIOLOGY 3, 5 (John M. Walker ed., 2003).

[81] *Id.* So ubiquitous is the technology that it is now used even in high school biology classes.

[82] The value of the PCR technique developed by Mullis is indisputable, as it comprises a foundational tool for modern genetic research. In other words, provided that Mullis and Cetus were able to preserve the secrecy of the PCR technique (as Mullis initially argued in favor of, *see* RABINOW, *supra* note 79, at 121), they likely would have had a commercially valuable product even in the absence of a patent system.

[83] The first of Dr. Mullis's patents on PCR, U.S. Patent Nos. 4,683,195 and 4,683,202, was issued in mid-1987; prior to that time the invention had already been widely described in co-authored publications. *See, e.g.*, Kary Mullis et al., *Specific Enzymatic Amplification of DNA in Vitro: The Polymerase Chain Reaction*, *in* 51 COLD SPRING HARBOR SYMPOSIA ON QUANTITATIVE BIOLOGY 263 (1986); Kary Mullis & Fred A. Faloona, *Specific Synthesis of DNA in Vitro via a Polymerase-Catalyzed Chain Reaction*, 155(F) METHODS IN ENZYMOLOGY 335 (1987); Randall K. Saiki et al., *Analysis of Enzymatically Amplified β-globin and HLA DQα DNA with Allele-Specific Oligonucleotide Probes*, 324 NATURE 163–66 (1986); Randall K. Saiki et al., *Enzymatic Amplification of Beta-Globin Genomic Sequences and Restriction Site Analysis for Diagnosis of Sickle Cell Anemia*, 230 SCIENCE 1350 (1985); Randall K. Saiki et al., *A Novel Method for the Prenatal Diagnosis of Sickle Cell Anemia*, 324 AMER. SOC. HUM. GENETICS 164 (1985).

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has been cited in subsequent publications.[84] And long after Mullis has faded from the scene, the technology continues to be improved upon.[85]

The Mullis story is not atypical. The publication of scientific and technical articles by patenting inventors is common. Alexander Graham Bell not only invented the telephone, he also spoke and wrote about it.[86] Gugliemo Marconi both patented the wireless radio[87] and published articles on wireless telegraphic communication.[88] In 1909, Leo Baekeland both obtained his patent on Bakelite[89] and published *The Synthesis, Constitution and Uses of Bakelite*.[90] Arthur Schawlow, Charles Townes, and Gordon Gould, considered the three central inventors of the laser,[91] published extensively on the subject.[92] Selman Waksman and Albert Schatz both wrote about streptomycin,[93] an early antibiotic, and patented their discovery.[94] There are many other examples as well.[95]

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[84] According to Google Scholar, the Taq article, Randall K. Saiki et al., *Primer-Directed Enzymatic Amplification of DNA with a Thermostable DNA Polymerase*, 239 SCIENCE 487 (1988), has been cited by 15,449 scholarly publications as of June 5, 2012.

[85] *See* RABINOW, *supra* note 79, at 2 ("In less than a decade, PCR has become simultaneously a routine component of every molecular biology laboratory and a constantly improving tool whose growth potential has shown no signs of leveling off.").

[86] *See* A. Graham Bell, *Researches in Telephony*, 12 PROCEEDINGS OF THE AMERICAN ACADEMY OF ARTS AND SCIENCES 1, 1-10 (1876); A. Graham Bell, *Researches in Electric Telephony*, 6 JOURNAL OF THE SOCIETY OF TELEGRAPH ENGINEERS 385, 385-421 (1877); U.S. Patent No. 174,465 (1876).

[87] U.S. Patent No. 624,516.

[88] *See, e.g.*, G. Marconi, *Wireless Telegraphy*, 28 JOURNAL OF THE INSTITUTION OF ELECTRICAL ENGINEERS 273, 273-290 (1899).

[89] U.S. Patent No. 942,699.

[90] L.H. Baekeland, *The Synthesis, Constitution, and Uses of Bakelite*, 1 IND. ENG. CHEM. 149, 149–61 (1909); HAROLD EVANS ET AL., THEY MADE AMERICA 97 (2004) (provides a short biography of Baekeland's life and inventions).

[91] Who actually invented the laser is a question that historians continue to debate. *See* NICK TAYLOR, LASER: THE INVENTOR, THE NOBEL LAUREATE, AND THE THIRTY-YEAR PATENT WAR (2000); JEFF HECHT, BEAM: THE RACE TO MAKE THE LASER (2010). Regardless, all three of the front-running candidates for the title published about their work.

[92] A.L. Schawlow & C.H. Townes, *Infrared and Optical Masers*, 112 PHY. REV. 1940, 1940-49 (1958); Leonard R. Solon, Raphael Aronson & Gordon Gould, *Physiological Implications of Laser Beams*, 134 SCI. 1506, 1506–08 (1961). Gould continued to publish even as his patent applications remained in limbo. For an account of the laser patent war, see TAYLOR, *supra* note 91.

[93] *See, e.g.*, U.S. Patent No. 2,449,866 (Sept. 21, 1948). *See also* William Kingston, *Streptomycin,* Schatz v. Waksman*, and the Balance of Credit for Discovery*, 59 J. HIST. MED. ALLIED. SCI. 441, 450

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That these scientist-inventors published should not be surprising: the desire to share the results of research—to publish, to speak at conferences, and to disseminate their discoveries to the world—can be powerful.[96] Kary Mullis himself was later awarded the Nobel Prize in Chemistry for his work.[97] These publications and conferences lay the groundwork for the next set of developments and discoveries.[98] Nor are scientists alone: companies, too, want their scientists to publish. Letting scientists engage in self-promoting activities such as publication is a common motivational mechanism for managing professional employees.[99] Early

(2004) ("Because Merck financed Waksman's research, any successful results were of course intended to be protected by patents.").

[94] *See* Albert Schatz, Elizabeth Bugle & Selman A. Waksman, *Streptomycin, a Substance Exhibiting Antibiotic Activity Against Gram-Positive and Gram-Negative Bacteria*, 55 EXP. BIOL. MED. 66, 66–69 (1944); Albert Schatz & Selman A. Waksman, *Effect of Streptomycin and Other Antibiotic Substances upon* Mycobacterium tuberculosis *and Related Organisms*, 57 EXP. BIOL. MED. 244, 244–48 (1944); Selman A. Waksman & Albert Schatz, *Streptomycin-origin, nature, and properties*, 34 J. AM. PHARM. ASSOC. 273, 273–91 (1945). For Schatz's account of the development of streptomycin, *see* Albert Schatz, *The True Story of the Discovery of Streptomycin*, 4 ACTINOMYCETES 27, 27-39 (1993), *available at* http://www.albertschatzphd.com/?cat=articles&subcat=streptomycin&itemnum=001. Google Scholar indicates that the 1944 article has been cited 566 times as of June 5, 2012.

[95] Charles Goodyear (vulcanized rubber): U.S. Patent No. 3462 (Mar. 9, 1844); CHARLES GOODYEAR, THE APPLICATIONS AND USES OF VULCANIZED GUM-ELASTIC WITH DESCRIPTIONS AND DIRECTIONS FOR MANUFACTURING PURPOSES (1855). For an account of Goodyear's life, *see* Evans et al., *supra* note 90; Wilson Greatbatch (implantable pacemaker): U.S. Patent No. 3,057,356; William M. Chardack, Andrew A. Gage & Wilson Greatbatch, *Experimental Observations and Clinical Experiences With the Correction of Complete Heart Block by an Implantable Self-Contained Pacemaker*, 7 TRANSACTIONS—AM. SOC'Y FOR ARTIFICIAL INTERNAL ORGANS 286, 286–94 (1961); WILSON GREATBATCH, THE MAKING OF THE PACEMAKER: CELEBRATING A LIFESAVING INVENTION 30 (2000).

[96] *See, e.g.*, RABINOW, *supra* note 79, at 31.

[97] *Id.* at 4.

[98] *See, e.g.*, Stefano Breschi & Christian Catalini, *Tracing the Linkages Between Science and Technology: An Exploratory Analysis of the Research Networks Among Scientists and Inventors*, 39 RES. POL'Y 14 (2010) (reporting the central role of author-inventors in ensuring the connectivity between scientific research networks and private technology). Even commentators who are skeptical of the conventional disclosure function of patents acknowledge the importance of scientific publications. *See, e.g.*, Lemley, *supra* note 3, at 746–47.

[99] *See, e.g.*, Ralph Katz, *Managing Technological Innovation in Organizations*, *in* THE HUMAN SIDE OF MANAGING TECHNOLOGICAL INNOVATION 675 (Ralph Katz ed., 2d ed. 2004); Donald C. Pelz, *Creative Tensions in the Research and Development Climate*, *in* MANAGING PROFESSIONALS IN INNOVATIVE ORGANIZATIONS 37–48 (Ralph Katz ed., 1988); Ralph Katz, *Motivating Technical Professionals Today*, 48 RES.-TECH. MGMT. 19 (2005), *available at* http://www.ingentaconnect.com/content/iri/rtm/2005/00000048/00000006/art00004#expand/collapse; Fiona Murray, *The Role of Academic Inventors in Entrepreneurial Firms: Sharing the Laboratory Life*, 33 RES. POL'Y 643 (2004).

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publication may help prevent others from obtaining patents of their own.[100] And scientific publications may be necessary for widespread adoption of new products.[101]

But imagine again a world without patents. Would Cetus have permitted Dr. Mullis to publish the results of his scientific research? Or would it instead have restricted his publications in order to maintain the monetary value of the PCR and Taq secrets for as long as it could?[102]

It is reasonable to at least suspect the latter. Firms exist to extract value from their intellectual and human capital. If the only way to monetize an invention is to maintain it as a secret, firms cannot afford to let that information escape. Regardless of the motivational impact of allowing employees to publish, regardless of the desires of the employees, in a world where the only mechanism for encouraging companies to invest in invention is a secrecy regime, employee publication is a nigh unaffordable luxury.[103] Although patents do not completely

[100] Rabinow suggests that this pressure may have been especially present in the biotechnology industry of the 1980's. *See* RABINOW, *supra* note 79, at 25–27. For a theoretical discussion of the concept, *see generally* Gideon Parchomovsky, *Publish or Perish*, 98 MICH. L. REV. 926 (2000); Rebecca S. Eisenberg, *The Promise and Perils of Strategic Publication to Create Prior Art: A Response to* Professor Parchomovsky, 98 MICH. L. REV. 2358 (2000).

[101] Dow Chemical is one company that makes extensive use of scholarly publications. *Journal Publications*, DOW, http://www.dow.com/innovation/knowledge/journal/ (last visited July 2, 2012).

[102] Of course, the calculus that companies use in deciding whether to treat something as a trade secret rather than seek patent protection is far more complicated than this simply binary choice. *See, e.g.*, Risch, *supra* note 68, at 171–74 (discussing factors that companies consider when deciding whether to keep something a trade secret); David L. Schwartz, *Protecting Improvements to Manufacturing Processes*, 17 INTELL. PROP. & TECH. L.J. 8, 10–11 (2005) (same). This decision may in part depend on how easy the invention would be to reverse-engineer. Perhaps, due to the nature of PCR, Cetus might have been unable to maintain their secrecy; i.e., they are self-disclosing inventions. In that instance, Cetus might not have invested resources towards their development at all, as discussed infra Part III.C, if its primary purpose was to obtain profit from its investments in research. An alternative does bear consideration—perhaps Cetus and Dr. Mullins were motivated by other reasons to invent—reputational purposes, for instance, or humanitarianism. *See* Hubbard, *supra* note 77, at 376–88 (discussing non-financial motivations to invent). But money clearly played an important role in this particular invention, as Cetus was a business—and not just a business, but a publicly traded company with investors to satisfy and a profit to generate. *See* RABINOW, *supra* note 79, at 46.

[103] This hypothetical result is arguably too extreme. Certainly companies may be forced by valuable employees to allow *some* publication, although it may lack useful technical details. But in a world without patents, such publications would be the rare exception, as the need to monetize innovations would in most instances grossly outweigh the value of an individual employee.

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free inventors and their firms from the decision of secrecy versus disclosure, they make the latter possible while preserving the ability to monetize the invention.[104]

The category of scientific and technical publications also illustrates the limitations of peripheral disclosures. The existence of patent-facilitated publication lies against a backdrop in which publication of technological developments occurs even in the absence of any possibility of direct financial gain. Numerous scientific articles are published every day, many of which have nothing to do with any monetizable technology.[105] As Arti Rai has discussed in the context of biotechnology, inventors and their financial supporters may invent and disclose for reasons that transcend the raw desire to monetize a new technology.[106] James Watson, Francis Crick, and Rosalind Franklin, the trio who discovered the double-helical structure of the DNA molecule, illustrate Rai's point.[107] Watson and Crick published their groundbreaking discovery in a climate of non-commercialization, well before the science of molecular biology was ready for practical application.[108] Social norms—particularly those in basic scientific fields—have long stimulated scientists to disclose their ideas and discoveries to the public, even in the absence of any possibility of monetizing the discovery or invention.[109] And even potentially monetizable inventions are published without patent protection; much of the early work in biotechnology was published without patents,[110] as is much of the software developed today.

It stands to reason, then, that while in some circumstances patents may catalyze peripheral disclosures, in others patents may be unnecessary. One possible

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[104] Note that patents free inventors to publish about their inventions not just after the patent issues but even while the application is pending, as note 58 illustrates in the case of Mullis. *See also* Holbrook, *supra* note 10, at 146 (making this point). For a discussion of how firms embrace patents, see Brenda Sandburg, *Cisco Streamlines Patent Process*, THE RECORDER (Sept. 20, 2005), http://www.law.com/jsp/cc/PubArticleCC.jsp?id=900005437299 (registration required).

[105] Take, for example, the journal ECOLOGY, published by the Ecological Society of America. The vast majority of articles published in that journal, although providing social benefit in that they enhance our understanding of our ecosystem, are unlikely to directly lead to a monetizable product or process.

[106] Rai, *supra* note 75.

[107] For two viewpoints on the discovery of the double-helical structure of DNA, compare JAMES D. WATSON, THE DOUBLE HELIX: A PERSONAL ACCOUNT OF THE DISCOVERY OF THE STRUCTURE OF DNA (1968), *with* ANNE SAYRE, ROSALIND FRANKLIN AND DNA (1975).

[108] *See* Rai, *supra* note 75 (describing the discovery and publication of the structure of DNA in a noncommercial environment).

[109] *Id.* at 119.

[110] *See* Mark Lemley, *Patenting Nanotechnology*, 58 STAN. L. REV. 601, 609 (2005).

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way to separate the two is to look at variations in the scientific fields themselves. As Robert Merges and Richard Nelson have pointed out, not all technological areas behave the same when it comes to the effects patents may have on innovation in general.[111] This is perhaps equally true when dealing with disclosures. Peripheral disclosure effects may be weaker in technological areas where publication and disclosure may and does occur in the absence of patents.

Variations in social norms unlinked to particular technological fields may also affect the prevalence of peripheral disclosures. Rai's discussion of the effect of basic scientific norms on early molecular biology research illustrates this point: these norms "promote a public domain of freely available scientific information, independent choice in the selection of research topics, and (perhaps above all) respect for uninhibited scientific invention."[112] Yet, changes in the legal structure of intellectual property, beginning in the mid-1970s, and a movement towards academic-industry collaboration weakened traditional scientific norms that favored communalism and discouraged secrecy.[113] In this climate, peripheral disclosures arguably became more important. Government or academy-funded researchers may traditionally have been willing to publish their inventions even in the absence of patents, but industry-funded researchers may be less willing or unable to do so without that security.

B. Product Marketing

To maximize market saturation and profit, firms are driven to market their goods and services through a variety of techniquest and approaches. While some marketing practices by firms require little disclosure, other efforts are helped by, and may even necessitate, the revelation of information about how a product or process works. Although many of these disclosures consist of general, relatively low-value information about the new invention, others take the form of specific technical documents targeted at those who may be able to use the information to enhance their own innovations.

General low-disclosure marketing practices take a variety of forms and often are such a seemingly mainstream component of society that they hardly seem like disclosures at all. Take, for example, the practice of offering tours of

[111] Merges & Nelson, *supra* note 27, at 843.

[112] Rai, *supra* note 75, at 89–90.

[113] *Id.* at 115.

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manufacturing facilities.[114] During these tours, members of the public enter the premises to observe how the company makes its products.[115] The company sometimes even explains interesting details about its manufacturing process. These tours provide a marketing benefit for the company in that they augment interest in its products; they also may result in the disclosure of some small amount of technical information to the public.[116]

General-audience marketing materials may also reveal or identify the inventor's technological advances. Take, for instance, the Dyson vacuum cleaner, whose website urges a consumer: "[f]ind out why a Dyson vacuum cleaner is different,"[117] and provides illustrations and videos explaining the components of the heavily patented vacuum.[118] In the absence of a patent system, firms would find it more difficult to employ such marketing efforts without losing some ability to monetize of the invention.[119]

These disclosures are, admittedly, of relatively low technological value. No one is going to be building Boeing's newest jetliner after taking a tour of its manufacturing facility. But they nevertheless establish a continual baseline seepage of information about new technologies.

On the other extreme, marketing activities directed at more sophisticated consumers may require substantial disclosure of technical information about

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[114] Numerous companies offer tours of their factories. *See, e.g.*, *Ben & Jerry's Ice Cream—Waterbury Factory Tours*, BEN & JERRY'S, http://www.benjerry.com/scoop-shops/factory-tours/ (last visited July 2, 2012); *Boeing: Future of Flight Aviation Center & Boeing Tour*, BOEING, http://www.boeing.com/commercial/tours/index.html (last visited July 2, 2012); *JPL Public Tours—Free Public Tours*, JET PROPULSION LABORATORY, http://www.jpl.nasa.gov/events/tours/views/index.cfm (last visited July 2, 2012); *York Facility Factor Tours*, HARLEY-DAVIDSON, http://www.harley-davidson.com/en_US/Content/Pages/Factory_Tours/york.html (last visited July 2, 2012).

[115] On a tour of Boeing's Everett factory, for example, visitors are permitted to observe the construction of Boeing planes, including its not-yet available 787 Dreamliner.

[116] Similar to the factory tour are documentary television programs explaining how various products are manufactured. While these programs do not reveal every manufacturing secret, they often demonstrate useful and novel techniques, some of which may be protected by patents. An example is the television program "How It's Made" on the Science channel. HOW IT'S MADE (Science Channel 2001-Present). http://science.discovery.com/tv/how-its-made/ (last visited July 2, 2012).

[117] Legendary pitchman Billy Mays also springs to mind, with his call that "The secret is in the . . . !" while touting some new gadget.

[118] *Vacuum Cleaners*, DYSON, www.dyson.com/vacuums/default.asp (last visited July 2, 2012).

[119] The centrality of the inventive aspect of a product is also shown in advertisers' frequent assertions that their products are "patented" or "patent pending." *See* Hubbard, *supra* note 77, at 381–82. It is the inventive aspect that makes the product appealing.

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product and process. Dow Chemical's marketing behavior, for example, contains elements of this type of strategy.[120] Perusing Dow's website reveals a wealth of information and publications, such as a technical paper describing the development of a new generation of novel olefin block copolymers, a flexible polymer that performs under high temperatures while maintaining its other mechanical properties.[121] The paper details the stepping-stones that led to the new product and describes some of its properties.[122] These types of marketing materials serve the company's purpose of educating participants in the relevant markets about Dow's products; they also reveal information that the company could have elected to keep secret. Patents make these technological disclosures for marketing purposes feasible. Unsurprisingly, Dow has a substantial history of patenting, with over 18,000 granted U.S. patents since 1920.[123] But for its ability to seek patent protection for its new olefin block copolymer technology, for instance, it would be more costly for it to employ a disclosure-oriented marketing technique.[124]

It would be a stretch to claim that every technical disclosure for marketing purposes is a peripheral disclosure; certainly disclosures will occur even in the absence of a patent system.[125] If the value to the firm of disclosing the information exceeds the cost in terms of the risk that the disclosure will improve a competitor's relative position, a rational firm will disclose the information. Nevertheless, the availability of patent protection increases the likelihood that such disclosures will occur when the possibility of a patent is present because the risk that the disclosure will improve a competitor's relative position is lower.

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[120] Ashish Arora & Andrea Fosfuri, *Licensing in the Chemical Industry*, 16 n.17 (Heinz College, Working Paper No. 24, 1998), *available at* http://www.heinz.cmu.edu/research/310full.pdf. *See also* Dow Chemical Company Employee Agreement, DOW, http://msdssearch.dow.com/PublishedLiteratureDOWCOM/dh_03ed/0901b803803edb96.pdf?filepath=familyhealth/pdfs/noreg/165-02004.pdf&fromPage=GetDoc.

[121] Kurt W. Swogger, Edmund M. Carnahan, Wendy D. Hoenig & Anthony R. Frencham, *The Development of a New Generation of Novel Olefin Block Copolymers: From Molecular Design to Market Development*, DOW (June 2006), http://www.dow.com/scripts/litorder.asp?filepath=infuse/pdfs/noreg/788-00301.pdf.

[122] *See id.*

[123] *See Patents*, DOW, http://www.dow.com/innovation/achievements/patents/ (last visited July 2, 2012).

[124] The Swogger technical paper notes that Dow Chemical has filed patent applications on the new technology described in the paper. *See* Swogger et al., *supra* note 121, at 11.

[125] Technical disclosures may also consist of information that is already available or obvious to the public. For example, a product manual that contains basic information about electricity is not a providing a peripheral disclosure. On the other hand, an installation manual that explains how to disassemble and service a new type of dishwasher may be.

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The software industry illustrates this counterpoint. In the software industry, moving first may itself offer a substantial advantage against copyists.[126] First movers may thus be freer to disclose information about their technologies through marketing materials and support documents even in the absence of patent protection. Thus, for inventions that can be adequately monetized via first mover advantages, peripheral disclosures may be less common.

C. Creation of Self-Disclosing Inventions

In his criticism of conventional disclosure theory, Alan Devlin argues that conventional theory does not provide a primary justification for the patent system because it suffers from inherent flaws that render it a poor vehicle for encouraging dissemination of information.[127] Rather, he suggests, the main justification for the patent system is that it incentivizes the development and commercialization of self-disclosing inventions—those whose technological underpinnings can be easily perceived once placed in the stream of commerce—that would not otherwise be created in its absence.[128]

As Devlin notes, "[t]he patent system is designed to induce innovation that would otherwise take place at suboptimal rates."[129] It solves the public goods problem associated with non-rivalrous, non-excludable information goods, and in particular, inventions that can easily be reverse engineered.[130] The problem is that prospective inventors of public goods will be reluctant to devote capital to the process of developing such readily-copied inventions because they will be unable to recoup their investment.[131] Unlike inventions that could be protected through secrecy, then, self-disclosing inventions are most appropriate for patent protection

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[126] *See* Ted Sichelman & Stuart J.H. Graham, *Patenting by Entrepreneurs: An Empirical Study*, 17 MICH. TELECOMM. & TECH. L. REV. 111, 137 n.141 (2010) ("First-mover advantages are particularly relevant in fast-moving industries, such as software and the Internet.").

[127] Devlin, *supra* note 10, at 417–18.

[128] *Id.* at 404. Devlin uses the term "self-revealing" instead of "self-disclosing"; both convey the idea that once the invention is brought to market, its technological underpinnings can be ascertained by a person of skill in the art. I use the term "self-disclosing" to be consistent with other scholars' terminology, *see* Strandburg, *supra* note 10, and to avoid confusing the term with Devlin's concept of "self-*realizing*" inventions, *see* Alan Devlin & Neel Sukhatme, *Self-Realizing Inventions and the Utilitarian Foundation of Patent Law*, 51 WM. & MARY L. REV. 897 (2009).

[129] Devlin, *supra* note 10, at 412.

[130] *Id.* at 413–14.

[131] *Id.* at 414.

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because without a patent system the public would be deprived of these important products.[132]

Although Devlin is correct in his view that patents incentivize the creation of a certain type of invention into which few resources would be allocated in a world where secrecy is the only mechanism for protecting technological ideas, an alternative way to apply this concept is to view it in terms of a shift in invention resource allocation as opposed to operating as an incentive to invent at all.[133] In this alternative approach, at leas some inventors are going to invest in invention even under a secrecy regime, they will just be more likely to invest in those inventions that can be protected by secrecy, i.e. that are not self-disclosing. What patents do is shift where inventors choose to make their investments, encouraging investment in the developing inventions that are self-disclosing as opposed to those that are not.

This matters because self-disclosing inventions possess a utility that non-self-disclosing inventions do not. Self-disclosing inventions are not valuable simply as new products or processes whose existence provides a benefit to users, i.e., their functional utility. They are also valuable because of the information they provide to the world: to inventors, to competitors, and to the public at large.[134] By favoring development of self-disclosing inventions over non-self-disclosing inventions, the patent system causes information to be disseminated in the form of self-disclosing inventions, providing the groundwork for the next iteration of invention.

Picture again a world in which there is no patent system. If the value of two inventions is otherwise equal, an inventor would rather develop a non-self-disclosing invention because of its greater potential value in a patentless world. Think, for example, of the innovative medieval smith. Are his efforts best placed into developing a new forging technique that he can keep as a secret, but use to produce exceptionally strong plough blades? Or should he place his best efforts

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[132] *Id.* at 418.

[133] Devlin's theory thus is less a traditional incentive story, and more about the *type* of inventions towards which inventive activity is being directed. In other words, one effect of the patent system is not that it necessarily encourages inventors to invest in invention—inventors might do so in the absence of a patent system; they just invest in non-self-disclosing inventions. Instead, the availability of patents cause inventors to shift where they allocate those resources: rather than investing in non-self-disclosing inventions, they may elect to invest them in the creation of self-disclosing inventions, which in individual instances may offer social benefits that are greater than investments in secret inventions.

[134] In economic terms, if one assumes that a self-disclosing invention and a non-self-disclosing invention have equal functional utility, then the former necessarily has a greater societal benefit, because it provides both its functional utility as well as the benefit of its informational component to the public.

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into developing a novel plough shape that is particularly effective?[135] The former is preferable, presumably, because once the plough is placed on the market it can be easily copied by others, perhaps at a lower cost, whereas the smith can continue to reap a benefit from the forging process while it remains a secret.

But which of these inventions provides a more socially-optimal outcome—the forging process that dies with the smith or the plough that is copied and improved upon by countless generations? Under the utilitarian principles underlying the analysis in this Article, the latter is unquestionably the better invention, and resources invested towards its development are better spent, from society's perspective, than those spent developing a secret process.

In a world with a patent system, investment in self-disclosing inventions is placed on an equal—or perhaps even greater—footing with secret inventions. Patents shift investment towards self-disclosing inventions and away from secret inventions.[136] And by encouraging the preference for self-disclosing inventions over the alternative, more of these information-providing seeds are created, feeding technological advancement.[137]

D. Litigation

In order to protect their intellectual property, owners sometimes must resort to litigation. Ultimately, it is the ability to seek redress for violations of intellectual property rights through the judicial system that gives such rights their substance. One aspect of litigation is that it is a relatively public forum given the strong

[135] For this example, it is a given that plough blades constructed via the new process or made in the new shape have equal functional utility; i.e., they are equally effective at plowing.

[136] Nor is this concept purely theoretical; Petra Moser's study of world fairs indicates that patent systems shift inventive activity more towards the creation of self-disclosing inventions. *See* Petra Moser, Innovation Without Patents—Evidence from the World Fairs (Apr. 15, 2011) (unpublished working paper), *available at* http://ssrn.com/abstract=930241. This shift has profound consequences in terms of the informational content these inventions provide to the public.

[137] Admittedly, just as with the product marketing discussed supra Part III.B., it would be absurd to claim that every self-disclosing invention was a consequence of a patent system. The heavy plow was invented long before the advent of even the Venetian patent system. LYNN WHITE JR., MEDIEVAL TECHNOLOGY AND SOCIAL CHANGE 50 (1962) ("[O]nce the Slavs got the heavy plough, we have no reason to date its arrival among them very long before the Avar invasion of 568 [AD] . . . ."); Edward C. Walterscheid, *The Early Evolution of the United States Patent Law: Antecedents (Part 1)*, 76 J. PAT. & TRADEMARK OFF. SOC'Y 697, 707–09 (1994). That is not the point; the point is that the existence of a patent system exerts some pressure, at least at the margins, on the willingness of potential inventors to invest in self-disclosing inventions as opposed to secret inventions. The extent of that effect is necessarily the subject of future, likely empirical, research.

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interest in transparency of the judicial system.[138] As a result, technical details of products and processes may be revealed, especially during trials.[139]

Patents play an important role in these disclosures. A firm that protects its technical inventions through patents is more likely to use the courts to enforce those rights than a firm relying on secrecy.[140] Thus, patents push firms towards use of the judicial system to protect their intellectual property, and patents might free a firm to disclose more information during litigation than it might otherwise be willing to in their absence.[141] This may take the form of less need to seek draconian protective orders, for example, or a greater willingness to offer technical testimony in open court. Litigation, then, can be a form of peripheral disclosure.

E. Licensing

Patents may also encourage the dissemination of information through private transactions that would not occur but for the existence of patents. Kenneth Arrow's Information Paradox theory posits that it may be difficult or impossible for sellers of technological information about new inventions to engage in technology transfer transactions absent some form of property right in the technology.[142] Patents

[138] *See In re* Violation of Rule 28(D), 635 F.3d 1352 (Fed. Cir. 2011).

[139] Most firms will undoubtedly seek protective orders, such as under Federal Rule of Civil Procedure 26(c), to preserve the confidentiality of their technical information. Such devices work—to a point. *See, e.g.*, Alan Lawrence, Comment, *The Value of Copyright Law as a Deterrent to Discovery Abuse*, 138 U. PENN. L. REV. 549, 565–69 (1989) (discussing the limitations of protective orders in protecting trade secrets). In addition, courts are generally reluctant to limit public access to their proceedings, even when trade secrets might be involved. *See, e.g.*, U.S. Investigations Servs., LLC v. Callihan, No. 2:11-cv-0355, 2011 WL 1157256 (W.D. Pa. Mar. 29, 2011) (denying trade secret plaintiff's request to close courtroom during a temporary restraining order proceeding). Furthermore, the more advanced the stage of litigation, the more difficult it is to shield such information from public eyes. *See In re* Violation of Rule 28(D), 635 F.3d at 1358 (commenting that "[w]here the party seeks to limit the disclosure of information actually introduced at trial, an even stronger showing of prejudice or harm may be required to warrant limitations on disclosure.").

[140] To clarify: here I refer to a firm relying on *secrecy* as opposed to trade secrecy. A firm that relies solely on secrecy to monetize its inventions would necessarily be utilizing an extrajudicial mechanism. A legal doctrine of trade secrecy changes this somewhat—although even there, innovator firms may be less willing (although not entirely unwilling) to resort to the courts and, once there, less willing to fight public access to technological information than when a patent is involved.

[141] Note the difference between disclosure and litigation discovery provided solely to an opponent or its counsel. Firms are subject to broad discovery obligations during litigation, under which they must often provide highly sensitive information to opposing counsel, typically under the confines of a highly restrictive protective order. Such private exchanges are different from disclosures that are made in publicly filed documents. It is the latter to which I refer, although there is reason to question the degree to which confidentiality of this information will be maintained. *See supra* note 139.

[142] Arrow, *supra* note 20.

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provide an escape from the paradox, allowing inventors to disclose information about the technology in the context of these transactions without losing the ability to monetize the invention.[143] Although this type of information exchange may be difficult to prove in practice,[144] given the confidential nature of licensing transactions, there is a sound basis for questioning the effectiveness of the principal alternative—the use of nondisclosure agreements.[145] In a related fashion, technology-pooling arrangements may allow companies to share technologies; these arrangements are made more feasible by patents.[146]

F. Dissemination of Technology

Patents do not simply free inventors to publish about their inventions; they do not merely allow companies to describe the inner workings of their technology in marketing materials without fear of losing its commercial value; they do not just encourage investment in self-disclosing inventions. They also incentivize inventors to disseminate information[147] about their inventions as widely as possible by offering a reward to inventors who engage in this behavior.

One of the leading proponents of treating patents as property rights, Scott Kieff, theorizes that patents play an important role in encouraging inventors to commercialize their inventions.[148] Patents do so by facilitating investment in the costly and risky commercialization activities necessary to turn new inventions into actual goods and services.[149] Property rights, with their clear boundaries and strong

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[143] Lemley, *supra* note 3, at 748.

[144] *See id.* at 782 (asserting that whether or not the licensing rationale for patent law is true is ultimately an empirical question).

[145] For instance, it is frequently difficult to prove that an NDA has been breached, or a critical third party may refuse to sign an NDA. *See* Stuart J.H. Graham & Ted Sichelman, *Why Do Start-Ups Patent?*, 23 BERKELEY TECH. L.J. 1063, 1082 (2008). This may be particularly true when the refusing third party has significant power relative to the inventor, such as in the case when an inventor is dealing with a large corporation that may be the only viable licensee of the technology. Furthermore, nondisclosure agreements are unable to bind third parties who come into possession of the technology, and thus patents can provide security even against these entities. *See id.* (positing that "[p]atents may offer a stronger 'fix' to information disclosure than merely using NDAs.").

[146] *See* Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations*, 84 CALIF. L. REV. 1293, 1347–48 (1996).

[147] Here, I am specifically referring to dissemination, rather than just simple disclosure, as discussed *supra* note 2.

[148] F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697 (2001).

[149] *Id.* at 736.

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rights of exclusion, attract resources because investors can recover the costs of commercializing novel inventions.[150] For example, investment in commercialization of new inventions in areas such as biotechnology might be heavily curtailed in the absence of a patent system because of the large difference between average cost and marginal cost, thus granting a competitive advantage to copyists of new commercial products.[151] Patents thus function not just as an incentive to create new inventions, but also as a mechanism to encourage inventors to engage in the post-invention activities necessary to provide those new inventions to consumers in a useful and practical form.

In much the same way that patents encourage inventors to commercialize their inventions, they also incentivize inventors to invest in sharing information about their innovation. This sharing helps an invention to be broadly adopted by others, thus producing rents for the inventor that flow from the use of the patented technology.[152]

There are two principal ways in which inventors can monetize their inventions: through self-use, such as in the production of a new commercial product made by the inventor or the inventor's firm, or through use by others. An inventor may obtain revenue via the latter route by engaging in a licensing transaction or, alternately, by enforcing a patent in litigation.[153] These two methods can be broadly described as collecting patent rents. In either case, an inventor seeking to monetize the invention through patent rents is best served when others

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[150] *Id.* at 747.

[151] *Id.* "Marginal cost" represents the incremental cost associated with each new use of the invention. "Average cost" includes the marginal cost, but also takes into account the fixed costs of inventing and commercializing. Average costs are thus necessarily greater than marginal costs. Inventors must charge at least average cost in order to break even; copyists may frequently be able to charge a price much closer to marginal costs. *See id.* at 728.

[152] In addition to the way in which patents encourage inventors to disseminate technology if they intend to exert a rent-taking approach to monetization of the invention, patents may also create an additional incentive for inventors to develop knowledge and know-how around their patented inventions and offer to share that information with licensees. *See* Risch, *supra* note 68, at 170 ("Because patents and other technology often require additional information to be useful to the licensee (whether intended by the creator or not), a desire to license or sell the underlying asset will incentivize the creation or improvement of know-how that can be licensed as well.").

[153] Not all inventors may choose to monetize their patents through third party uses of the technology. This category of peripheral disclosure thus may not apply to these self-use inventors. But many, many inventions are monetized through licensing transactions and other third-party uses. *See* Ted Sichelman, *Commercializing Patents*, 62 STAN. L. REV. 341, 368 n.158 (2010) (citing reports of licensing transactions in the hundreds of billions of dollars annually).

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adopt the new technology. The patent system creates a legal form of exclusivity that rewards inventors whose technology is adopted by others.

It is precisely because the patent system offers exclusive rights to new technologies that inventors are encouraged to share that underlying technology as widely as possible.[154] Inventors following the "use by others" path of monetizing their invention have little to lose, and everything to gain by disseminating their new technology as broadly as possible. Show off the new gadget; explain how it works and why it is so great; tout your invention on the internet, complete with a video showing the clever trick that makes it work. Patent rights encourage inventors to do all of this in the hopes that others will adopt their new technologies, an adoption that may result in the payment of rents.

This idea of incentivizing the dissemination of technology in order to encourage its adoption for patent rent purposes may bear a superficial similarity to prospect theory, but the two are analytically quite distinct. Prospect theory offers a justification for patent rights based on the idea that inventors are in the best position to make decisions about future research in their area—in other words, patents allow inventors to "stake their claim" to a particular area of technology, giving them an incentive to maximize the value of future research in that area.[155] Prospect theory is thus focused on the ability of patent holders to exercise direct control over downstream research flowing from their upstream invention, offering benefits such as coordinated research plans and avoidance of duplicate efforts.[156]

Critics of prospect theory argue that this is actually a highly inefficient practice in terms of furthering future research, pointing both to the historical inability of early inventors to continue to innovate, as well as early inventors' lack of need for allowing any further invention.[157] Thomas Edison provides a classic example, transitioning from an inventor-entrepreneur to an established manufacturer and opponent of future refinements of electrical technology.[158]

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[154] Of course, patents may be used for a variety of purposes—to block competitors, maintain open markets, or protect specific products or processes used by the patent holder in order to secure a competitive advantage. But the patent system does operate as a bit of a carrot to encourage the dissemination of information for those who choose to follow a disclose and license strategy—the more firms that adopt the inventor's technology, the greater the potential licensing revenue base.

[155] *See* Kitch, *supra* note 20, at 265.

[156] *Id.*

[157] Merges & Nelson, *supra* note 27, at 876–78; John F. Duffy, *Rethinking the Prospect Theory of Patents*, 71 U. CHI. L. REV. 439 (2004).

[158] Merges & Nelson, *supra* note 27, at 872 n.141.

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Regardless of whether these criticisms of prospect theory are correct, they do not impact the interests of the inventor in encouraging adoption of the present novel technology. The key distinction between the dissemination incentive and prospect theory is that the latter relates to who controls prospective research, while the former relates to the dissemination of the newly invented technology. Inventors who seek to derive revenue from patent rents are best served by disseminating that technology as broadly as possible with the goal of broad adoption by others. As Merges and Nelson note, before becoming an opponent of the new "alternating current" technology, Edison was a "maverick trying to get incandescent lighting accepted as feasible."[159] Patents encourage this behavior by providing a probabilistic reward in return for aiding the dissemination of new technology.[160]

IV. IMPLICATIONS OF THE THEORY

A. As a Response to Criticisms of the Patent System

On a policy level, the fundamental question for patent scholars, the courts, and Congress is whether the patent system effectively promotes invention. One incarnation of this discussion is the debate over whether the patent system is better at promoting invention than a world without patents. This debate is in no way trivial: there are numerous critics of the system who argue there would be more invention in a world without patents.[161] Implicit in these criticisms is an

[159] *Id.*

[160] Note that while this concept may provide some theoretical support for the existence of a patent system, it is not costless, at least as the patent system is currently structured. Under the current regime, patentees need not disclose the existence of patents at the same time as they disclose their technology, thus allowing the patentee to spring its patents on a perhaps unsuspecting adopter of its technology once that technology has been widely adopted—the quintessential patent troll. *See* Jason A. Rantanen, *Slaying the Troll: Litigation as an Effective Strategy Against Patent Threats*, 23 SANTA CLARA COMPUTER & HIGH TECH. L.J. 159, 164–66 (2006) (exploring the concept of patent trolls). Furthermore, patentees may extract rents from users of their technology even if that technology was developed independently. Christopher A. Cotropia & Mark A. Lemley, *Copying in Patent Law*, 87 N.C. L. REV. 1421, 1425 (2009) (explaining that copying is not required to prove liability for patent infringement). Consequently, the probabilistic reward of patent rights is available even to inventors who decline to disseminate their technology but later choose to assert their patent rights against those who independently developed the technology. This article does not purport to offer a solution to either type of patent trolls, merely to point out that it is logical to expect that under a patent system entities are encouraged to disclose their technology in order to hasten its adoption by others as opposed to maintain that technology in secrecy.

[161] A summary of current critics of the patent system can be found in Hubbard, *supra* note 77, at 405–07. Examples include JAFFE & LERNER, *supra* note 21; BOLDRIN & LEVINE, *supra* note 21. Boldrin & Levine's work is particularly noteworthy—they suggest abolishing the patent and copyright system altogether to spur innovation. *Id.* at 253. Yet the effective consequence of their proposal would be more firms investing in secrecy, a consequence that they themselves acknowledge. *Id.* Greater secrecy

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endorsement of secrecy as a mechanism for monetizing invention.[162] While inventors and scientists may engage in technology-progressing activities for reasons unrelated to the desire to monetize their inventions and discoveries,[163] the further one moves away from basic research towards practical technologies, the less force these alternatives are likely to have. Thus, rejections of the patent system as a mechanism of technological progress are generally implicit endorsements of secrecy as a primary mechanism for monetizing inventions and encouraging investment in research and development.

The difficulty is that under a secrecy-based system, inventors *cannot* share information about their inventions without losing some or all of the ability to monetize them; voluntary disclosure, then, is less likely than under a patent system. This effect may not be perfect, but it is directionally indisputable: under a patent system, participants are able to share at least some invention-promoting information; under a secrecy regime, they are unable to share any information at all. Patents do not offer perfect peripheral disclosure; they merely offer significantly more than the alternative.[164]

Shifting the law to favor secret inventions thus carries with it a considerable risk in terms of the amount of information that is disclosed by inventors.[165] Such a move would have the effect of reducing peripheral disclosures—not in as extreme a fashion as a complete abolition of the patent system, but at least on the margins. Furthermore, the effect of such a policy shift would be to favor investment in the creation of non-self-disclosing inventions as well. Recall that as between self-disclosing inventions and non-self-disclosing inventions, only the latter are

necessarily leads to less availability of information. Of course, there may be non-monetary reasons why inventors invent, as discussed in sources cited *supra* note 64 and accompanying text, that do not necessitate some form of secrecy, and circumstantial mechanisms that allow for monetization of inventions without relying on either secrecy or patents. *See* Sichelman & Graham, *supra* note 126, at 136–37 (describing alternate ways to monetize an invention such as first mover advantages and complementary assets). I am not convinced, however, that alternative reasons for inventing are, by themselves, sufficient drivers of all of the types of technological progress that provide significant social benefits, or that money isn't a motivating factor for many inventions. Obtaining profit is, after all, the central purpose of our modern market-based economy.

[162] Here I use the term "secrecy" to refer to both pure secrecy and trade-secrecy regimes.

[163] *See* sources cited *supra* note 64 and accompanying text.

[164] Anderson also argues that trade secrecy promotes more efficient disclosure to the proper individuals, i.e.: the small number of individuals to whom the inventor intends to reveal the information. Anderson, *supra* note 10. But this limited disclosure pales in significance to the broader peripheral disclosures allowed under a patent system.

[165] *Id.* at 919.

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protectable through any type of secrecy regime. Thus, the de facto effect of a shift towards secrecy would be to encourage investment in non-self-disclosing inventions. Further, since the pool of resources that can be devoted to invention is finite, the effect will be to reduce investment in self-disclosing inventions from which, as this article has explained, society derives a greater informational benefits. Based on this reasoning, it would be a great mistake to favor the creation of non-self-disclosing inventions over their counterparts and eliminate or reduce these building blocks of future progress.

B. As Addressing Some of the Weaknesses of Conventional Disclosure Theory

A theory of peripheral disclosure provides a potent response to criticisms of conventional disclosure theory because the two concepts rest on distinct justifications. And result in the disclosure of information that is different in substance and form. Peripheral disclosure thus compliments conventional disclosure by mitigating some of the problems identified by critics of conventional disclosure theory.

As discussed in Part I, one of the main arguments advanced against the conventional disclosure theory is that patents fail to convey useful technological information. They are cryptic documents drafted by lawyers; they are written for the purpose of maximizing the patent right, not clarity of teaching; they follow an archaic format and structure that must hew to sometimes esoteric rules established by the courts and patent office.

In contrast, consider the peripheral disclosures discussed above. They are often drafted by scientists and inventors—those of skill in the art—for other scientists and inventors.[166] They take a variety of forms, each conveying information in a different way.[167] And unlike patents, the driving purpose of a peripheral disclosure is unlikely to be patent scope maximization. Indeed, it is unlikely that the inventor's non-patent writings will even be considered in interpreting the patent scope.[168]

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[166] *See supra* Part III.A.

[167] A scientific article is likely to present information in a different way from a product manual, which itself may give different insights than examining the embodiment of a self-disclosing invention. *See also* North American Vaccine, Inc. v. American Cyanamid Co., 7 F.3d 1571, 1580 (Fed. Cir. 1993) (Rader, J., dissenting) ("Although a patent specification may supply guidance about the meaning of claim terms [] scientific literature differs in purpose, scope, and legal effect from patent writings.").

[168] *See id.* at 1578 ("A patent is to be interpreted by what it states rather than by what the inventor wrote in a scientific publication.").

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Another criticism leveled at conventional disclosure theory is that persons of skill in the art do not read patents for their technical content.[169] This criticism is inapplicable, at least in terms of its current articulation, to peripheral disclosures.[170] Peripheral disclosures are, by their very nature, intended to be read by persons of skill in the art in their field. Their function is often to serve a teaching function, and empirically there is good reason to believe that they fulfill this role.[171]

Given the peripheral disclosures that patents produce, should Congress abolish the inventors' mandatory disclosure obligation? Surely complying with these obligations—preparing a detailed specification, for instance—consumes both attorney and inventor time that might better be spent elsewhere, especially if the criticisms discussed in Part I are accurate. Besides, if peripheral disclosures do not suffer from many of the flaws of conventional disclosures, one might argue that the latter are unnecessary.

This would be the wrong conclusion to draw, however. Both conventional and peripheral disclosures have a role to play in revealing information about new inventions. Mandatory disclosures establish a minimum level of technical information that inventors must provide to the public. These disclosures are hardly perfect, and inventors may chafe at their obligations and comply with less than full enthusiasm, but they nonetheless set an important minimum threshold. Moreover, there is reason to believe on a practical level that patents *do* have disclosure value, regardless of the theoretical criticisms.[172]

Peripheral disclosures, on the other hand, may be greater or lesser than mandatory disclosures. Some inventors may elect to follow a practice of disclosing as little as possible on the belief that this maximizes the value of their invention. Other inventors may, for the reasons discussed in this article, decide that the value of the invention is maximized (or other incentives are satisfied) by broad peripheral disclosure.

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[169] *See supra* Part I.B.

[170] *See supra* Part I.B.

[171] *See supra* note 84 (reporting a citation count of over 15,000 for Mullis's 1988 article).

[172] *See* Oullette, *supra* note 5. In response to an early draft, I received several comments arguing that the criticisms of Part I.B. were unfounded, and that patents do provide significant technical information, although perhaps less so in certain fields. *See* Comments to *Peripheral Disclosure*, PATENTLY-O, http://www.patentlyo.com/patent/2011/08/peripheral-disclosure.html (last visited July 2, 2012). This may be so, but there are also limits to the amount of information conventional disclosures can and do reveal.

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Peripheral disclosures suffer from another important limitation: their quality is highly variable. Unlike conventional disclosure requirements, which attempt to mandate a minimum level of disclosure quality,[173] peripheral disclosures will be of vastly different qualities.[174] Incentives to voluntarily disclose technical information may vary depending on the circumstances, and the amount of useful information necessary to satisfy those incentives may be large or small. The quality and quantity of peripheral disclosures will depend on the owner's objective. For example, a licensing agreement which transfers core technical know-how will involve considerable disclosure of information, as compared to an advertisement of a new product, where it will be relatively minimal. Furthermore, the characteristics of the form may differ, impacting the quality or quantity of the disclosure. Scientific journals, for instance, may require certain types and degrees of disclosure as a prerequisite for publication that may necessitate a fairly complete revelation of the technology.[175] Marketing materials, on the other hand, may not need to convey much of the technology at all. Companies might offer factory tours, but not allow visitors to get close to important equipment or may shroud critical components. Other barriers might impede the quantity or type of information that is being disclosed.[176]

C. As a Tool for Understanding the Impact of Patent Legislation

On September 16, 2011, President Obama signed the Leahy-Smith America Invents Act into law. Congress passed this law ostensibly to "promote industries to continue to develop new technologies that spur growth and create jobs across the country which includes protecting the rights of small businesses and inventors from predatory behavior that could result in the cutting off of innovation."[177] While this

[173] It does so through the enablement, written description, and best mode requirements of 35 U.S.C. § 112 (2006).

[174] This is true of all disclosures, of course, not just peripheral disclosures. A scientific article may provide useful information about a new development, or it may not; an advertisement may be worthless puffery or impart valuable technical information, regardless of whether the patent system played a role in its production.

[175] Compare the contents of Schatz & Waksman's eighteen-page 1945 article on streptomycin with their two and a half-page patent specification. *See* sources cited *supra* note 92. The article contains photographs, detailed tables, various tips for isolation, and a substantial amount of information presented in readable prose. The patent contains a terse description of the isolation of streptomycin written in the formulaic language of a patent.

[176] *See* Seymore, *supra* note 5.

[177] Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 30, 125 Stat. 284, 339 (2011).

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avowed purpose goes directly to the incentive effects the AIA will purportedly have, it overlooks the disclosure effects of the act—particularly the effect it may have on peripheral disclosures. This section examines the impact specific sections of the AIA are likely to have on this type of disclosure.

1. Changes to Novelty Rules

The cornerstone of the AIA is a shift from a first-to-invent system of awarding patent rights to a first-to-file-or-disclose system. Under 35 U.S.C. § 102(a)(1), which will take effect on March 16, 2013, a person is not entitled to a patent if the invention "was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the *effective filing date* of the claimed invention."[178] The effective filing date limitation thus moves the cut-off date for what constitutes "prior art from a year before the application is filed to the day the application is filed.[179]

This new rule comes with a major exception, however: prior art does not include disclosures[180] made within one year of filing if "the subject matter disclosed had, before such disclosure, been publicly disclosed by the inventor or another who obtained the subject matter disclosed directly or indirectly from the inventor or a joint inventor."[181] In other words, inventors have some ability to shield prior art from the one-year period prior to filing by engaging in public disclosure.

This provision strengthens patent-driven reasons to disclose by encouraging disclosures that trigger the safe-harbor of the new provision. It may also encourage a disclosure race. If, as Gideon Parchomovsky has suggested, inventors involved in a patent race sometimes engage in strategic disclosures to stymie their competitors,[182] the AIA may fuel this behavior. Through early disclosure, inventors who are racing to develop a new technology can not only block their rivals from obtaining a patent—because the disclosure would operate as prior art against the rival's patenting attempts—but can also negate any subsequent attempt by the rival

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[178] § 3, 125 Stat. at 286 (emphasis added).

[179] *See id.*; 35 U.S.C. § 102(b) (2006).

[180] I interpret this term as referring to any of the categories of prior art discussed in the new § 102(a). There is disagreement as to whether it will be this broad, or how some of the § 102(a) categories would be interpreted in the context of § 102(b).

[181] § 3, 125 Stat. at 286 (containing an exception for disclosures by the inventor or another who obtained the subject matter from the inventor, as well as exceptions to the § 102(a)(2) category of prior art).

[182] Parchomovsky, *supra* note 100, at 929–30.

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to disclose patent-blocking information of equivalent content. Rather than a race to invent, perhaps this will produce a race to engage in early public disclosures. Unfortunately, any such effects are likely to be largely limited to inventors who desire to file only in the United States given a lack of similar self-disclosure exceptions in the rest of the world.[183]

2. Creation of a Prior User Defense

Even as the changes to the novelty rules may encourage a new type of peripheral disclosure, at least for U.S.-only inventors, the creation of a "prior user defense" pushes toward less disclosure. New 35 U.S.C. § 273 carries with it the potential to reduce peripheral disclosures, at least at the margins.[184]

New § 273 creates a defense to infringement based on prior commercial use. It can be raised by a person who "commercially used the subject matter in the United States, either in connection with an internal commercial use or an actual arm's length sale or other arm's length commercial transfer of a useful end result of such commercial use . . . at least 1 year before the earlier of either" the patentee's effective filing date or disclosure under § 102(b).[185]

This defense is most applicable to technologies that are capable of monetization through secrecy. A prior user defense is far less relevant for inventions whose workings are readily understandable once they are placed on the market because these products already represent potentially invalidating prior art. Under pre-AIA law, inventors who develop non-self-disclosing inventions are faced with a difficult choice: maintain the process as a trade secret, and run the risk of being blocked later by an inventor who obtains a patent, or file for a patent and

[183] Europe, for example, has a much more limited disclosure exception. *See, e.g.*, European Patent Convention art. 55, Oct. 5, 1973, 13 I.L.M. 268, 286.

[184] The effect of the prior user defense may indeed be marginal. Both commentators and the patent and trademark office indicate that they believe that the prior user defense created by the America Invents Act is unlikely to have much effect. *See Prior User Rights Defense: Hearing Before the H. Subcomm. on Intellectual Prop., Competition and the Internet of the H. Comm. on the Judiciary*, 112th Cong. 65–74 (2012) (statement of Dennis Crouch); U.S. PATENT & TRADEMARK OFFICE, REPORT ON THE PRIOR USER RIGHTS DEFENSE (2012). Yet, if the best justification for the prior user defense is that it is unlikely to have much of an impact, it is a flimsy basis for changing the law. At least as important as an understanding of the strength of the change is an understanding of its direction.

[185] § 5, 125 Stat. at 197.

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disclose the process to the public.[186] Both options have significant costs associated with their selection, but the patent and disclose option is hardly foreclosed.

The AIA's "prior user defense" reweights this decision in favor of maintaining secrecy by lowering the risk that the secret-keeper will be blocked by a later inventor. The directional effect of this change is to reduce the number of patents that are filed on secret inventions, and thus reduce the number of mandatory disclosures that accompany those patents.

Of course, not everyone accepts that these mandatory disclosures provide useful technological information.[187] Consider, however, the effects on peripheral disclosures—specifically, the impact on investment in self-disclosing inventions. The creation of a prior user defense re-calibrates the scale as between secret inventions and self-disclosing inventions. By making secrecy a more valuable protection strategy for inventors to pursue, inventors are likely to focus their efforts towards the creation of secret inventions as opposed to self-disclosing inventions, at least when the social utility that the inventor can monetize is otherwise equal. But self-disclosing inventions are inherently valuable for the information that they provide to the public and future inventors—a spillover that inventors cannot fully capture. The directional result may be the creation of fewer of these valuable inventions, thus diminishing the peripheral disclosures that accompany them.

Indeed, if an invention is being monetized through secrecy, the likelihood of public disclosures of the underlying technology is lower for the reasons discussed above in Part III. Secrecy is, after all, the antithesis of disclosure.

CONCLUSION

The idea that patents further invention by requiring that technological information be disclosed through the patent document is a good one in theory, but arguably less so in practice. There is reason to suspect that patents fail to fully disclose useful information about new inventions within the confines of the patent itself. The limitations of conventional disclosure theory suggest that perhaps the existence of a patent system cannot be justified on that ground alone.

The disclosure function of patents need not be so narrowly circumscribed, however. The patent system does not merely attempt to force inventors to reveal their secrets; rather, it frees them to do so without losing the ability to monetize

[186] Anderson, *supra* note 10, at 4 ("An innovator that chooses to patent cannot simultaneously enjoy trade secrecy because the patent application reveals her secret to the world.").

[187] *See supra* Part I.B.

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their inventions. This freedom manifests its benefits in a variety of ways: scientific publications, product marketing—even the existence of self-disclosing inventions themselves.

I do not contend that peripheral disclosure provides the sole justification for the patent system, or even that its effects are uniform and consistent across all fields and people. There is no one monolithic answer. Yet, just as incentives to invent and concerns about effects on competition should be considered when developing new laws intended to promote technological progress, so too should potential impacts on peripheral disclosures be taken into account.

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